Get Your Data Flowing with the Water Quality eXchange

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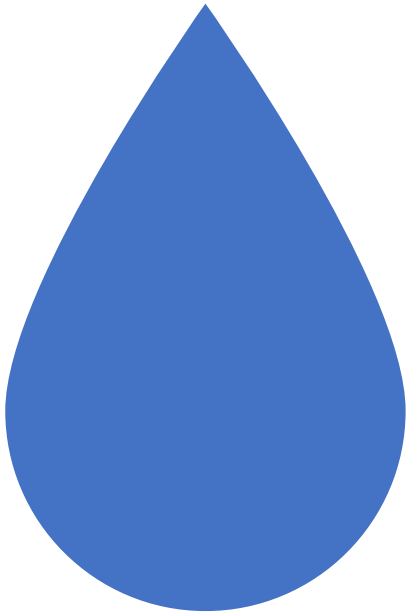
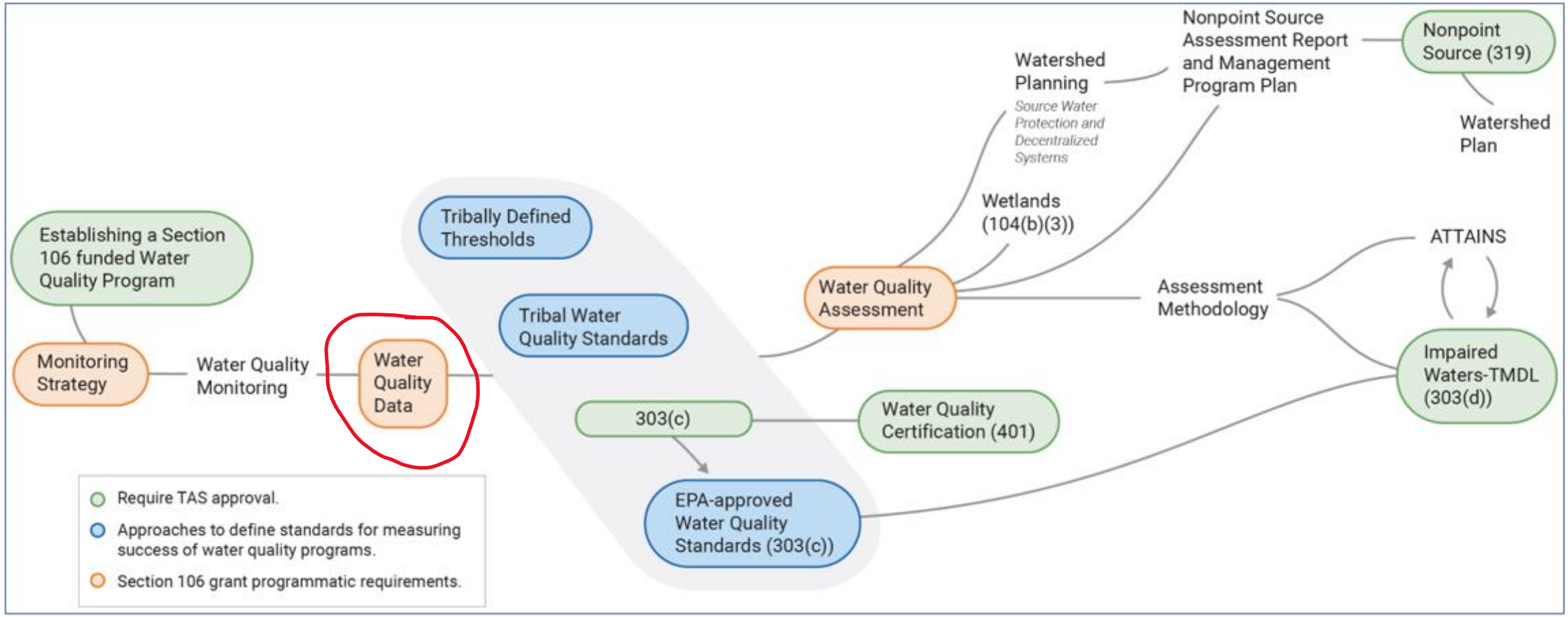
2024 Southwest Tribal CWA Training



What we'll cover today

- 106 Grant Data Reporting Requirements
- Managing your Water Quality Data
- What is WQX today?
- How to choose the best path to WQX for your program or dataset
- WQX Basics
  - Preparing data for submissions
  - WQX Web Templates
  - Import Configurations (Teach WQX to read your dataset as-is)
- How to use your data

Clean Water Act – Tribal Program Roadmap



Data Sovereignty

The Section 106 Program is committed to respecting tribal Indigenous Knowledge sovereignty practices. Indigenous Knowledge informs many aspects of tribal water quality programs and the information shared by Indigenous Knowledge holders is owned by them.

Tribes that use Section 106 funds to collect Indigenous Knowledge will not be required to report that shared knowledge as part of their grant requirements. Tribes are expected to meet the three reporting requirements (Monitoring Strategy, water quality data submitted through WQX, and Water Quality Assessment, as described in Chapter 6) but are not expected to share the underlying Indigenous Knowledge used to inform water quality objectives and management practices.

Section 106 Reporting Requirements - FAQs

Q1: When will Tribes be required comply with the WQX requirement?

A1: The WQX requirement will be implemented through a term and condition on a Tribe's grant. The FY 2024 Funding Recommendation (FY 2024 FR) will include the WQX T&C and waiver provision. For Tribes that are not currently providing data directly to WQX, funds awarded using the FY 2024 FR will either include the T&C or attach the waiver request.

Section 106 Reporting Requirements - FAQs

Q2: What if Tribes have sensitive data they are concerned about making publicly available?

A2: There may be site-specific situations where a Tribe has culturally sensitive data that they don't want to be made public. The Tribe should discuss with their Project Officer how best to report this data to WQX.

As a first step, the Tribe should communicate what aspect of the data is sensitive such as the location the sample was collected or the cultural use of the waterbody. Based on the specific aspect of sensitivity, the following options can be considered:

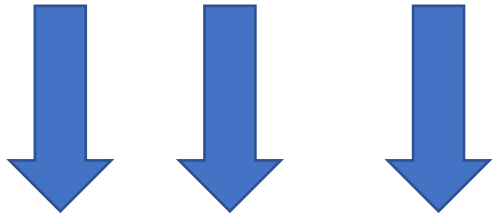
- Modify Location Data: Obscure the precise location by submitting generalized coordinate information
- Remove Cultural Use Information: No Cultural Use info or IK should be shared to WQX at any time
- Mark Sampling Data as Preliminary: Allows EPA staff to see the data, but it is not released to the public (WQP)
- Don't use 106/319 funds to collect the data (Data not shared to EPA):

Data Management

- Consider putting together a simple Data Management Plan
- Identify your raw data formats – lab reports, logger files, field forms, etc.
- Do you need to marry these datasets so they can work together?
- Data formats
- Metadata
- Data management technologies
- Data analysis/use

Standardized data formats

Each Characteristic (measure) occupies its own column



Matrix Style Dataset

- AKA “Flat” “Wide” “Tidy”

- Handy for analysis
- Compact
- Just the values
- Not the best way to manage your metadata though
- Requires a crosstab import config

Activity Identifier	Activity Start Date	Monitoring Location Identifier	Iron	Lead	Manganese
nwiswi.01.99208821	8/28/1992	USGS-04072050	1400	1.5	510
nwiswi.01.99208822	8/28/1992	USGS-04072050	1800	1.2	650
nwiswi.01.99208826	8/28/1992	USGS-04085110	2200	1.2	890
nwiswi.01.99208856	8/29/1992	USGS-04085475	1600	1.4	480
nwiswi.01.99407330	9/19/1994	USGS-04063700	120		250
nwiswi.01.99407332	9/19/1994	USGS-04063700	5000	1.2	2100
nwiswi.01.99407338	9/21/1994	USGS-04080798	1400	1.2	820
nwiswi.01.99407340	9/21/1994	USGS-04080798	1200	1	2400

Standardized data formats

Stacked Style Dataset

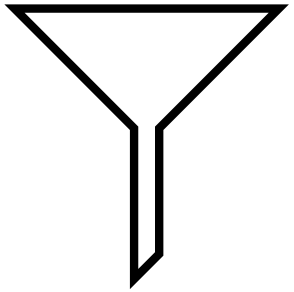
- AKA “Tall” “Narrow”

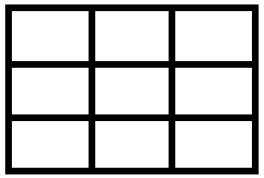
All measures in one column

Additional information about those measures

Result Identifier	Characteristic Name	Sample Fraction	Measure Value	Unit
NWIS-114877794	Stream width measure		3	ft
NWIS-114877795	Temperature, water		16.8	deg C
NWIS-114877797	Stream flow, instantaneous		0.19	ft3/s
NWIS-114877798	Specific conductance	Total	696	uS/cm @25C
NWIS-114877799	Acidity, (H+)	Total	0.00001	mg/l
NWIS-114877800	Oxygen	Dissolved	11.4	mg/l
NWIS-114877801	pH	Total	8.3	std units

- How data is stored/served by the WQP
- Good for data management
- Not ideal for data analysis
- Allows for metadata

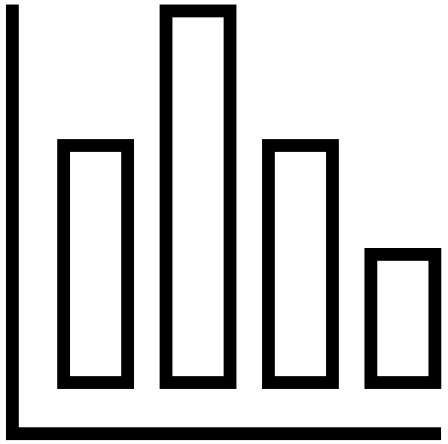




Spreadsheets

Manage datasets (not really a database)

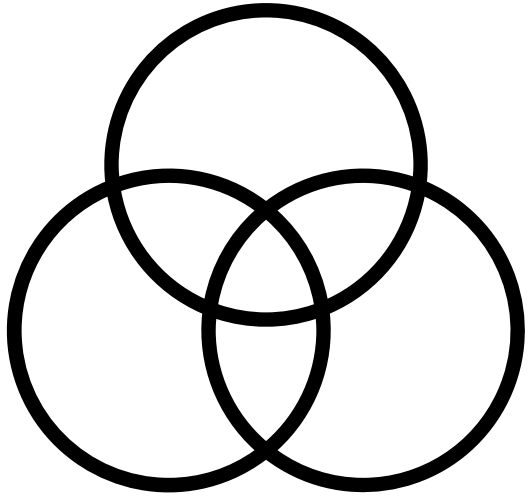
Very useful for manipulating, analyzing, organizing one dataset at a time

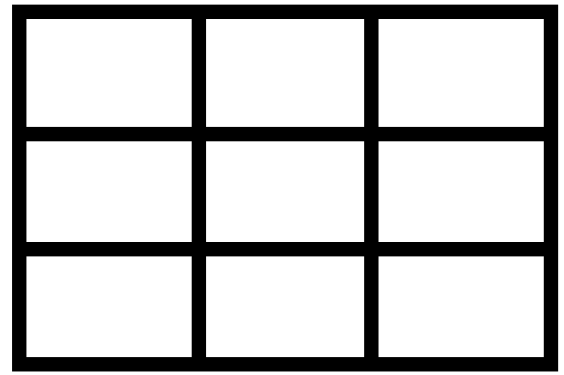


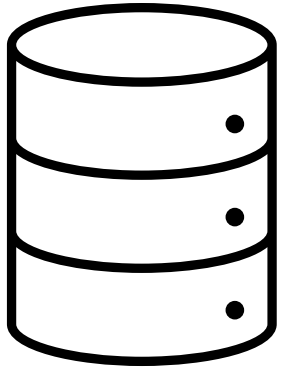
Expandable – Macros, external data, XML, data visualization

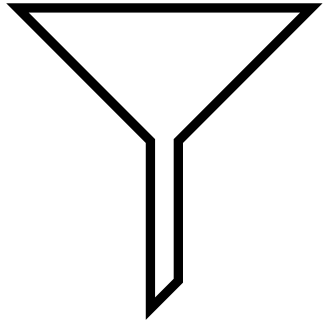
Relational Databases (light)

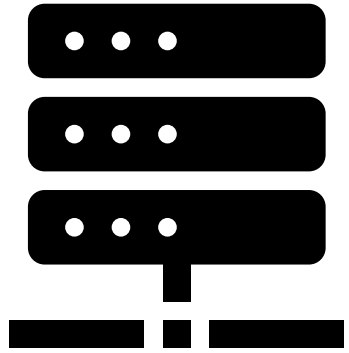
- MS Access (primarily)
- Entry-level database management
- Allows for the management of multiple tables of related data
- Connect, query, filter, update, or append data
- Ensure integrity of data quality/relationships
- Allows for front-end “forms” or “reports” or views of the data











What do we mean by relational?

Data of different types are each managed in their own table

We establish relationships between certain pieces of information in the tables

The related pieces of information are often (but not always) ID or “key” fields

This allows for more detailed information to be stored in separate tables, allowing for useful queries of the database

Ex. This is what allows users to query across place, time, program, and result type in the WQP

All Organizational Data

Org ID	Org Name
001	Minnesota Depart
002	Kentucky Departm
003	University of Was

All Project Data

Org ID	Prjct ID	Project Name
001	CYAN	Cyano Monitoring
001	PRB	Probabalistic mon
001	TRND	Trends Program

All Location Data

Org ID	Loc ID	Location Name
001	DBL	Deep Blue Lake
001	MR	Muddy Run
001	FC	Fishing Creek

Activities & Results Data & Metadata

Org ID	Proj ID	Loc ID	Result ID	Sample Date	Characteristic	Value	Unit
001	PRB	MR	001	5/3/2012	pH	7.6	SU
001	PRB	MR	002	4/17/2016	Temperature	19.1	Deg C
001	PRB	MR	003	4/23/2020	Conductivity	236	µS/cm

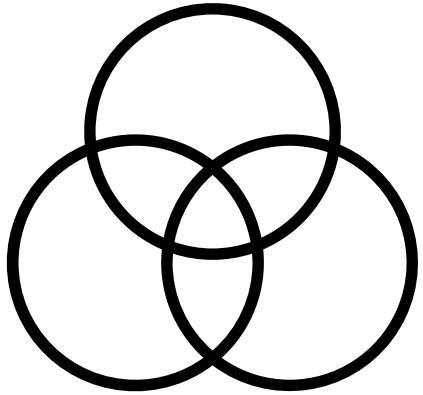
Relational Databases (Heavy)

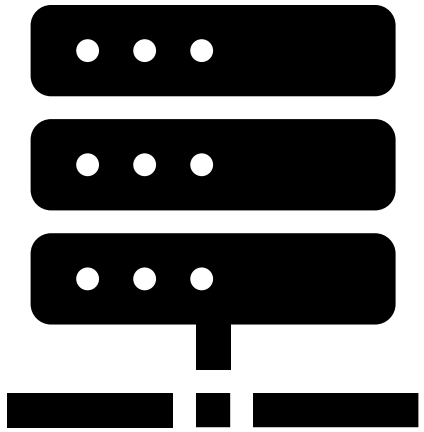
Enterprise

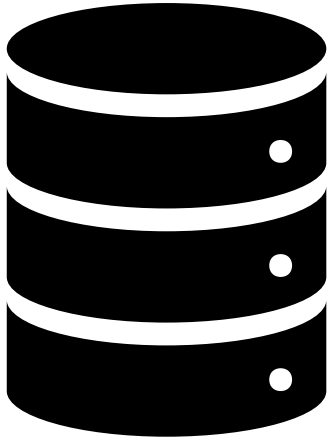
These are fully customized Enterprise database solutions usually built in Oracle, SQL Server, or PostGres, as examples.

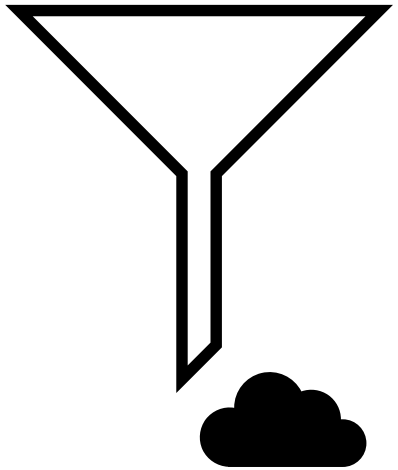
These systems are typically operated from a server or more commonly these days, in the Cloud.

These are typically built by developers, at some cost and may include front-ends for staff to access and manipulate.









Selecting a data management tool

Who needs to manage the data?

What resources are available?

How much data needs to be managed?

How often will you need to complete this task?

	Spreadsheets	**Relational dB lite**	**Enterprise dB**
Data Entry	√ (Can link forms)	√ (Can add forms)	Requires forms
Relational data	Some (Power Pivot)	√	√
Run queries		√	√
Manual data fixes	√	√	Dev req'd
Expertise required	Low	Medium	High
Costs required	Low	Low-Medium	Med-High
Ensure Data Integrity	Some	√	√

How can submitting to WQX help your program?

Data Security – You've invested a lot in your monitoring data. Sharing it to WQX ensures that there will always be a copy in case something happens on your end

Continuity – Turnover happens. We not only store your data, but also the pathway you've built. Happy to train new employees on WQX.

Data Management – Sprograms are relying solely on WWX/WQP to be their database.

Data Use – The Water Quality Portal is a modern data delivery service. Your data analysis team can build projects that call the WQP, allowing you to build online data portals, maps, and reports with ease.

EPA Connected Water Data Systems

Data Viewer

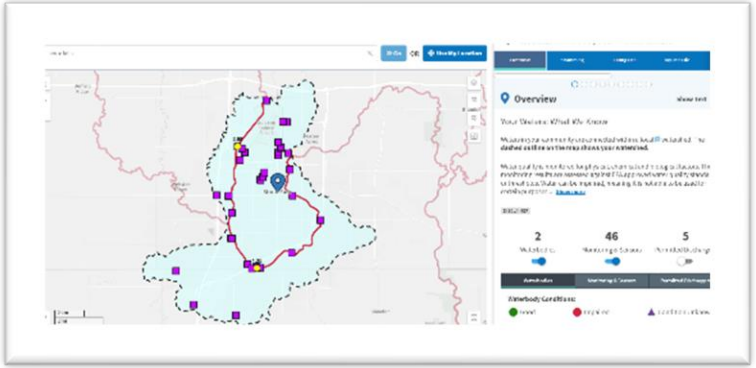
Data Portal

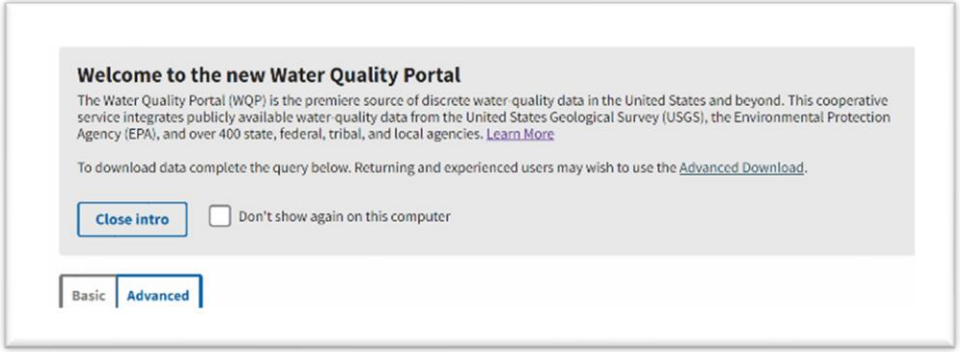
Data Standard

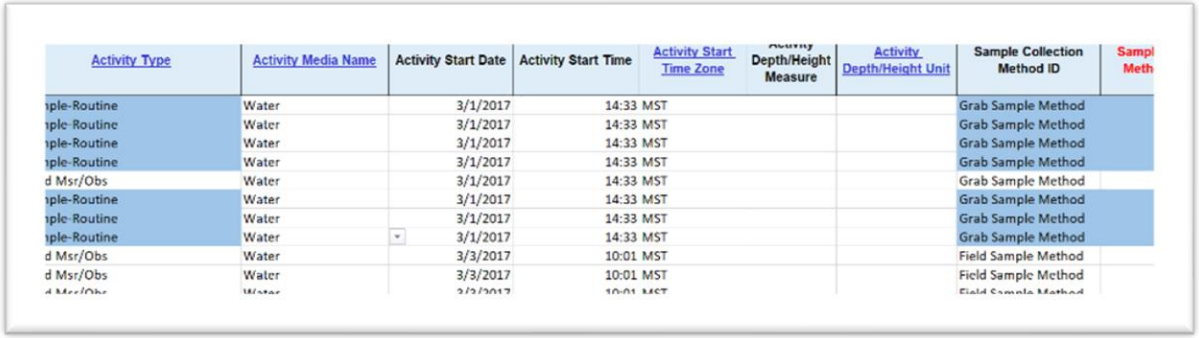
How's My Waterway?

Water Quality Portal

Water Quality eXchange





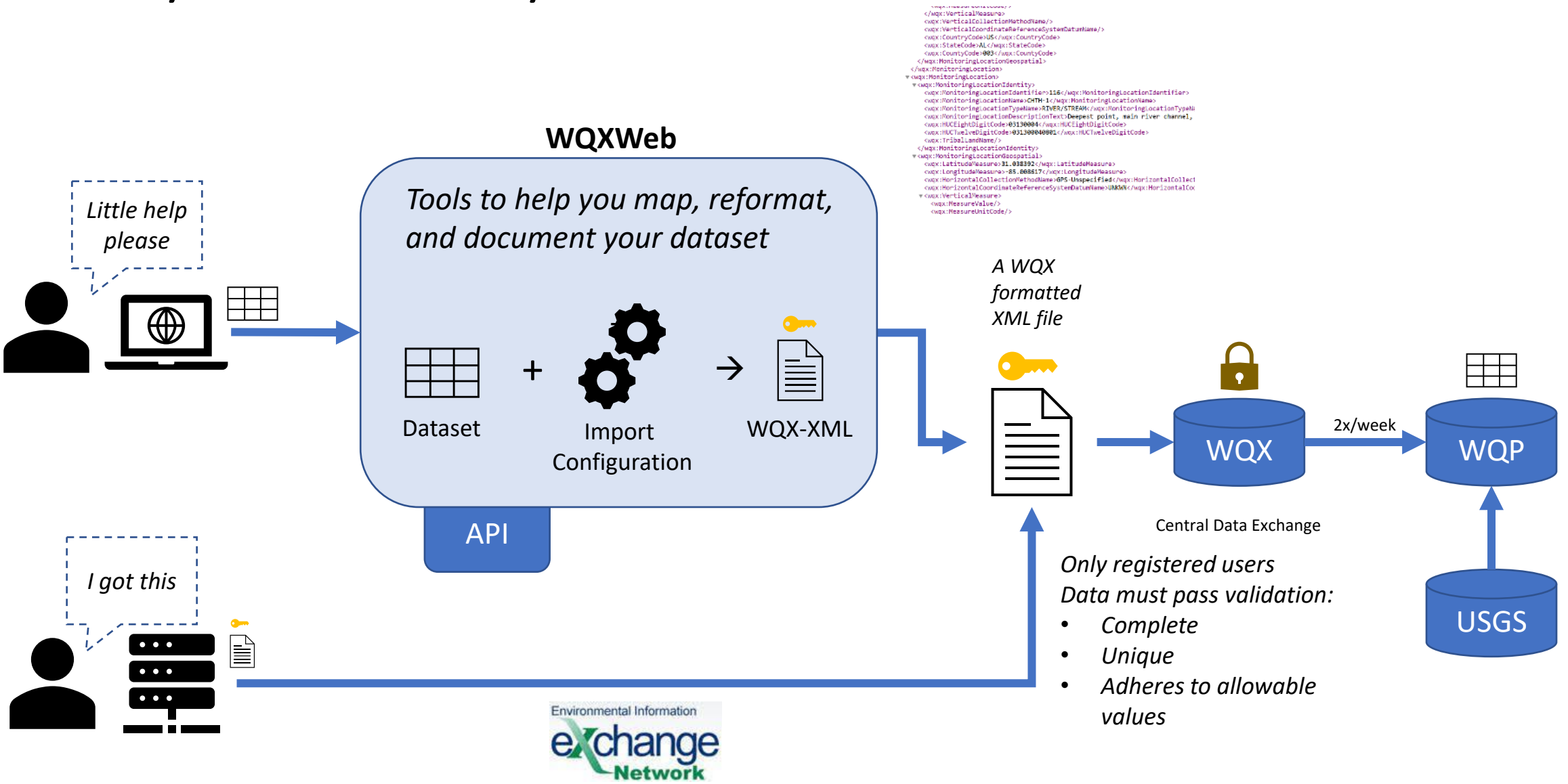


Activity Type	Activity Media Name	Activity Start Date	Activity Start Time	Activity Start Time Zone	Activity Depth/Height Measure	Activity Depth/Height Unit	Sample Collection Method ID	Sampl Meth
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
d Msr/Obs	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
ple-Routine	Water	3/1/2017	14:33	MST			Grab Sample Method	
d Msr/Obs	Water	3/3/2017	10:01	MST			Field Sample Method	
d Msr/Obs	Water	3/3/2017	10:01	MST			Field Sample Method	

What Is WQX today?

- WQX is a ‘standardized’ approach for sharing water quality monitoring data of various types
- WQX defines a common data model for communicating water quality data (sample data)
- Designed to be automated
- The structure of partner data systems don’t matter, so long as they can map data to WQX standards
- Many ways to prepare and submit data to WQX: including direct submissions, WQXWeb, and 3rd party apps

Ways to share your data to WQX



Submitting to WQX – Step-by-Step Example

A brief step-by-step demonstration to understand the overall process by using the WQX Web (Excel) Templates

Step 1. Register for a WQX Account

How to Sign up for a CDX/WQXWeb account

1. Email the WQX team to Request a WQX Web account

The email address is: wqx@epa.gov

First name

Middle name

Last name

Prefix (Mr./Mrs./Ms)

WQX Organization ID

WQX Organization Name

Mailing Address 1
Mailing Address 2
City
State
Zip/Postal Code
E-mail Address
Phone Number

EPA United States Environmental Protection Agency

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CONTACT US

WQX Web Account Registration

How to Gain Access to WQX Web

Access to WQX web occurs through EPA's portal for environmental data, the Central Data Exchange (CDX). This process involves registration of two accounts: one with CDX to verify your identity and allow you access to the WQX web application and one with the WQX team that will allow you to submit data to EPA for your specific organization. After registration of these two accounts, the process of accessing WQX web through CDX is seamless and only requires one login step. The WQX team will help guide you through registration and field any questions you may have along the way.

Registration Steps for CDX and WQX Web

1. Email the WQX team to Request a WQX Web account

To begin the process of setting up your WQX Web account, please provide the following information in an email to the WQX Team. The email address is: wqx@epa.gov

- First name
- Middle name
- Last name
- Prefix (Mr./Mrs./Ms)
- WQX Organization ID
- WQX Organization Name
- Mailing Address 1
- Mailing Address 2
- City
- State
- Zip/Postal Code
- E-mail Address
- Phone Number

Does my Organization have an ID registered with WQX?

All Organizations submitting data through WQX Web require a WQX Organization ID that is unique from any previous STORET Org IDs. Using the appropriate Organization ID is incredibly important in order to maintain consistency and decrease the chance of data duplication or deletion. If you are unsure if your organization has a WQX ID, the best way to find out is to search the Water Quality Portal EXIT under the '**Organization ID**' field. See this video tutorial all about how to search for this information: **Coming Soon**. If you are still unsure if your organization has a registered ID, ask the WQX team to assist you.

If you need to set up a WQX Organization ID, please contact the WQX help desk by email (wqx@epa.gov). We will ask that you provide us with the following information in order to set up the Organization ID:

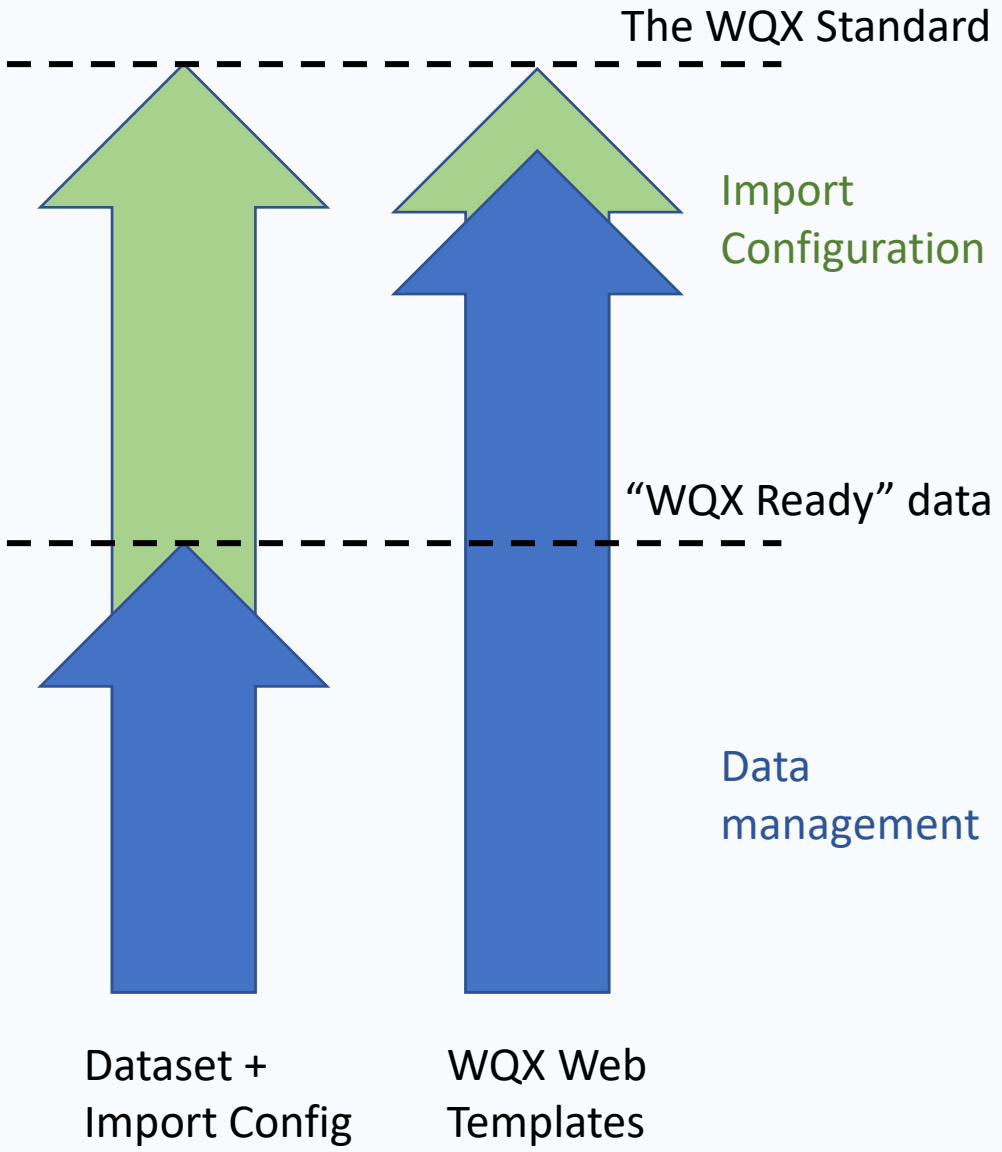
- WQX Organization ID of your choice (can be up to 30 characters long)
- WQX Organization Name
- Your contact information as outlined above

How to Register Page: https://www.epa.gov/waterdata/wqx-web-account-registration

Step 2. Choose a Path for the Dataset
What is “WQX ready” data?

Datasets do not need to match WQX 100% to be “WQX-ready”

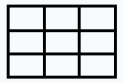
- The dataset should be in a standardized format (wide or tall)
- The dataset should be in one contiguous range of cells, not separated somehow
- Data should be complete and consistent for the primary identifying info (proj, loc, date)
- Required metadata is either already in the dataset or it can be added by the import configuration based on existing data elements
- Does NOT require full adoption of WQX terms and structure



Step 2. Choose a Path for the Dataset

Manual ⟷ *Custom / Automate*

WQX Web Excel Templates

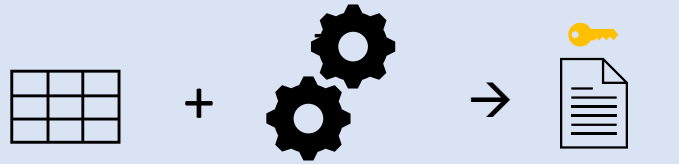


<u>Manually transform your data to the WQX standard before you upload</u>

- Use WQX fields
- Use WQX allowable values
- Simple import steps w/ no edits necessary
- Use a template designed for the data type you are uploading

WQXWeb

Tools to help you map, reformat, and document your dataset



Import Configurations

<u>Create an import configuration that instructs WQX how to read your dataset</u>

- Work with a stacked or matrix style data format
- Add your missing metadata elements through the IC
- Apply transformations to your dataset to achieve the standard
- Save the IC to import new data of this type in the future

Step 3. Assemble Your Data / Understand What's Needed

When you submit data to WQXWeb, you submit three tables, one each for Projects, Locations, and Activities/Results.

All Project Info

Prjct ID	Project Name
001	Cyano Monitoring
002	Probabalistic mon
003	Trends Program

Project ID
Project Name
Project Description

All Location Info

Loc ID	Location Name
001	Deep Blue Lake
002	Muddy Run
003	Fishing Creek

Location ID
Location Name
Location Type
Coordinates
Location Method

All Result-level Info and metadata

Activity ID	Sample Date	Characteristic	Value	Unit
003	5/3/2012	pH	7.6	SU
003	5/3/2012	Temperature	19.1	Deg C
003	5/3/2012	Conductivity	236	µS/cm

Sample Media
Start Date
Collection Method
Collection Equipment
Characteristic Name
*Other reqmnts

Result Value
Result Unit
Result Status
Analytical Methods
Result Value Type

How is data Organized and Stored in WQX ?

It can be helpful to think of the data as being stored in levels

…or related tables of information

*When you register

*Table 1

Org ID	Org Name
001	Minnesota Depart
002	Kentucky Departm
003	University of Was

Your WQX Organizational Account

*Table 2

Prjct ID	Project Name
001	Cyano Monitoring
002	Probabalistic mon
003	Trends Program

All Project Info

Loc ID	Location Name
001	Deep Blue Lake
002	Muddy Run
003	Fishing Creek

Unique Locations

*Table 3

Activity ID	Prjct ID*	Loc ID	Sample Date	Activity Type	Characteristic	Value	Unit	Sample Collection Method
001	002	003	4/23/2020	Sample-Routine	TSS	7.6	SU	Grab Sample Method
002	002	003	4/23/2020	Field Msr/Obs	Temperature	19.1	Deg C	Field Probe Method
002	002	003	4/23/2020	Field Msr/Obs	Conductivity	236	µS/cm	Field Probe Method

All Activities and Results

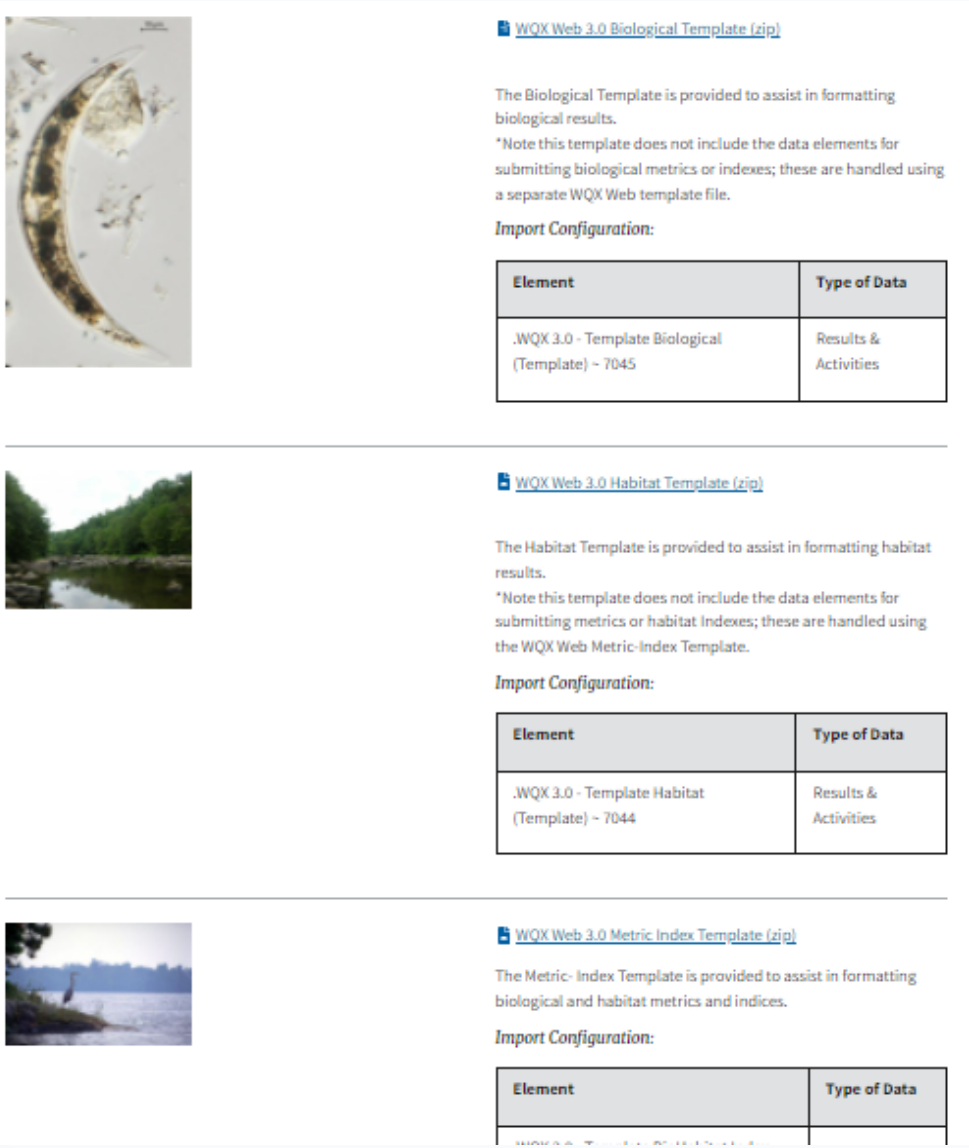
Step 4. Download a WQX Web Template

https://www.epa.gov/waterdata/water-quality-exchange-web-template-files

Using WQX – Templates	Water Quality Exchange Web Template User Guide | US EPA Link to Web Templates Web Templates Overview Video

Available WQX Web Templates

Physical/Chemical
Biological
Fish Tissue *New!
Habitat
Metric Indices
Lab Data
Continuous Template



WQX Web 3.0 Biological Template (zip)

The Biological Template is provided to assist in formatting biological results.
*Note this template does not include the data elements for submitting biological metrics or indexes; these are handled using a separate WQX Web template file.

Import Configuration:

Element	Type of Data
.WQX 3.0 - Template Biological (Template) - 7045	Results & Activities

WQX Web 3.0 Habitat Template (zip)

The Habitat Template is provided to assist in formatting habitat results.
*Note this template does not include the data elements for submitting metrics or habitat indexes; these are handled using the WQX Web Metric-Index Template.

Import Configuration:

Element	Type of Data
.WQX 3.0 - Template Habitat (Template) - 7044	Results & Activities

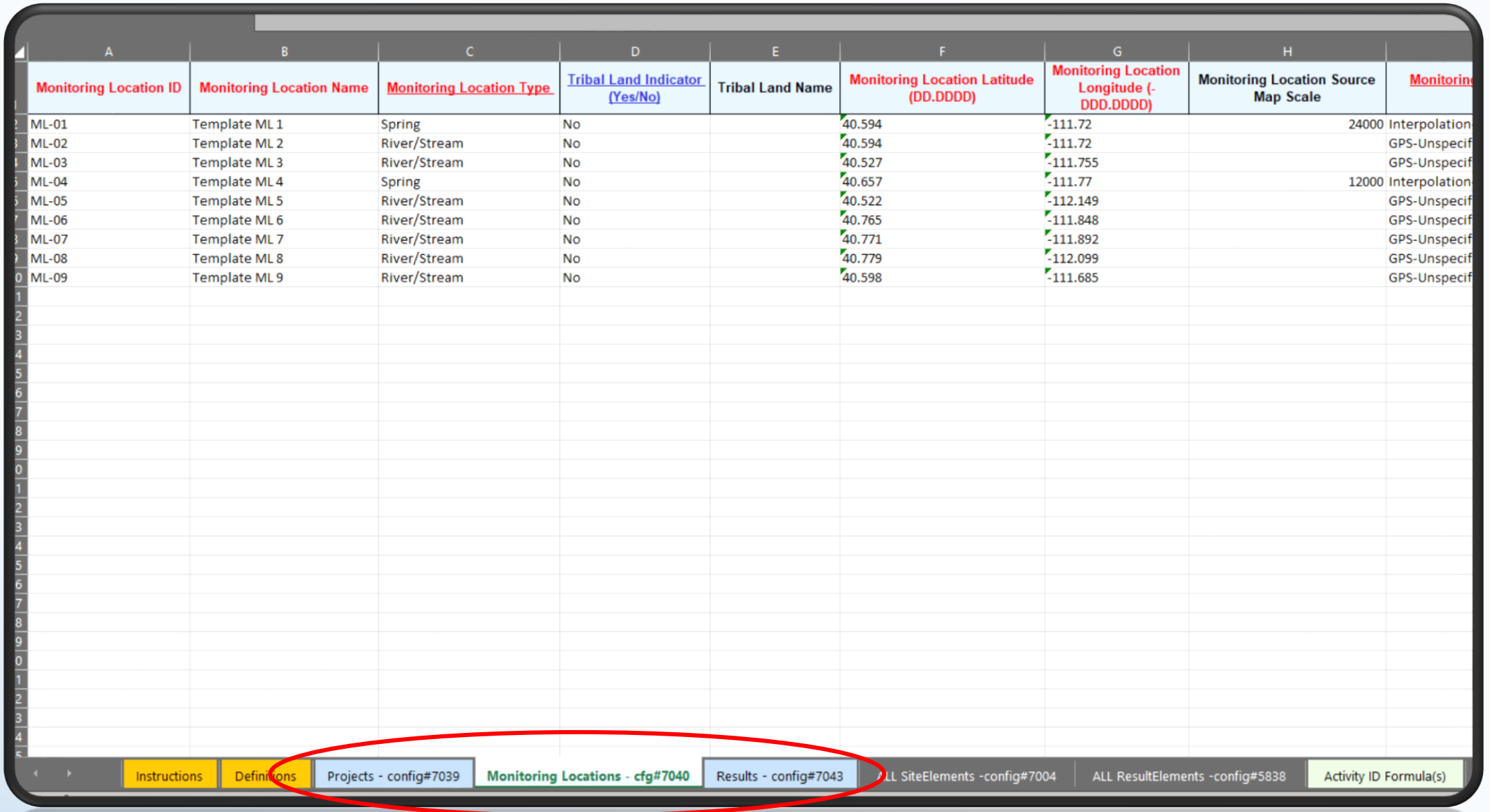
WQX Web 3.0 Metric Index Template (zip)

The Metric- Index Template is provided to assist in formatting biological and habitat metrics and indices.

Import Configuration:

Element	Type of Data

Step 5. Fill out the three data entry worksheets



Monitoring Location ID	Monitoring Location Name	Monitoring Location Type	Tribal Land Indicator (Yes/No)	Tribal Land Name	Monitoring Location Latitude (DD.DDDD)	Monitoring Location Longitude (-DDD.DDDD)	Monitoring Location Source Map Scale	Monitorin
ML-01	Template ML 1	Spring	No		40.594	-111.72	24000	Interpolation
ML-02	Template ML 2	River/Stream	No		40.594	-111.72		GPS-Unspecif
ML-03	Template ML 3	River/Stream	No		40.527	-111.755		GPS-Unspecif
ML-04	Template ML 4	Spring	No		40.657	-111.77	12000	Interpolation
ML-05	Template ML 5	River/Stream	No		40.522	-112.149		GPS-Unspecif
ML-06	Template ML 6	River/Stream	No		40.765	-111.848		GPS-Unspecif
ML-07	Template ML 7	River/Stream	No		40.771	-111.892		GPS-Unspecif
ML-08	Template ML 8	River/Stream	No		40.779	-112.099		GPS-Unspecif
ML-09	Template ML 9	River/Stream	No		40.598	-111.685		GPS-Unspecif

Instructions | Definitions | Projects - config#7039 | Monitoring Locations - cfg#7040 | Results - config#7043 | ALL SiteElements -config#7004 | ALL ResultElements -config#5838 | Activity ID Formula(s)

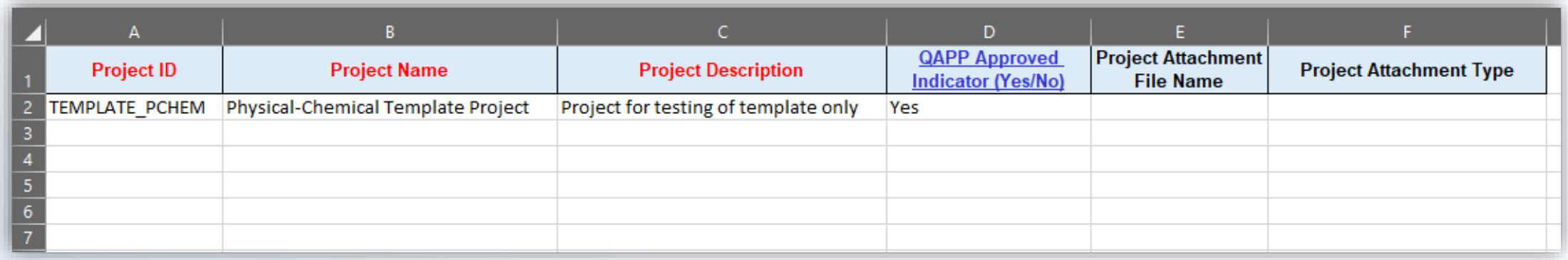
Step 5. Fill out the three data entry worksheets

Projects Tab – Provide an ID, name, and description for your project(s)

Red = Required

Hyperlink = Allowable values / validation

Black = Optional



	A	B	C	D	E	F
1	Project ID	Project Name	Project Description	QAPP Approved Indicator (Yes/No)	Project Attachment File Name	Project Attachment Type
2	TEMPLATE_PCHEM	Physical-Chemical Template Project	Project for testing of template only	Yes		
3						
4						
5						
6						
7						

Step 5. Fill out the three data entry worksheets

Locations Tab - Provide basic information on each unique (new) location in your dataset

Some fields only allow certain values. Links and cell references* have been provided to those value lists (blue/red).

	A	B	C	D	E	F	G	H	I	J
1	Monitoring Location ID	Monitoring Location Name	Monitoring Location Type	Tribal Land Indicator (Yes/No)	Tribal Land Name	Monitoring Location Latitude (DD.DDDD)	Monitoring Location Longitude (-DDD.DDDD)	Monitoring Location Source Map Scale	Monitoring Location Horizontal Collection Method	Monitoring Location Horizontal Coordinate Reference System
2	ML-01	Template ML 1	Spring	No		40.594	-111.72	24000	Interpolation-Map	NAD27
3	ML-02	Template ML 2	River/Stream	No		40.594	-111.72		GPS-Unspecified	NAD83
4	ML-03	Template ML 3	River/Stream	No		40.527	-111.755		GPS-Unspecified	NAD83
5	ML-04	Template ML 4	Spring	No		40.657	-111.77	12000	Interpolation-Map	NAD27
6	ML-05	Template ML 5	River/Stream	No		40.522	-112.149		GPS-Unspecified	NAD83
7	ML-06	Template ML 6	River/Stream	No		40.765	-111.848		GPS-Unspecified	NAD83
8	ML-07	Template ML 7	River/Stream	No		40.771	-111.892		GPS-Unspecified	NAD83
9	ML-08	Template ML 8	River/Stream	No		40.779	-112.099		GPS-Unspecified	NAD83
10	ML-09	Template ML 9	River/Stream	No		40.598	-111.685		GPS-Unspecified	NAD83
11										

You can download the allowable value lists by clicking on the links in the header row.

Step 5. Fill out the three data entry worksheets

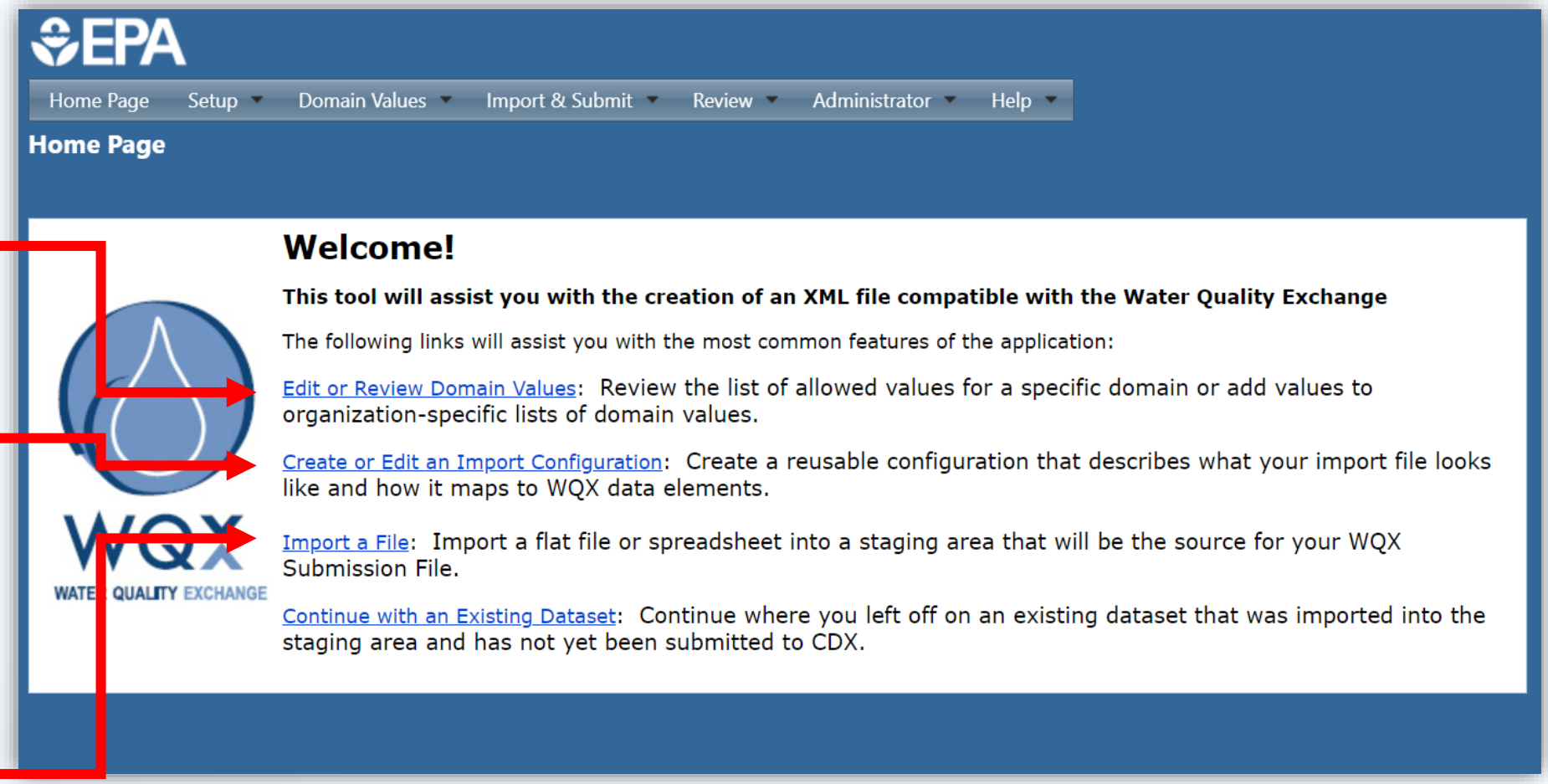
Results Tab - Provide basic information that describes your Activities and Results

	A	B	C	D	E	F	G	H	I
1	Project ID	Monitoring Location ID	Activity ID (CHILD-subset)	Activity ID User Supplied (PARENTs)	Activity Type	Activity Media Name	Activity Start Date	Activity Start Time	Activity Start Time Zone
2	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
3	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
4	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
5	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
6	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:FM:WB:		Field Msr/Obs	Water	3/1/2017	14:33	MST
7	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
8	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST
9	TEMPLATE_PCHEM	ML-06	ML-06:20170301:1433:SR:WB:		Sample-Routine	Water	3/1/2017	14:33	MST

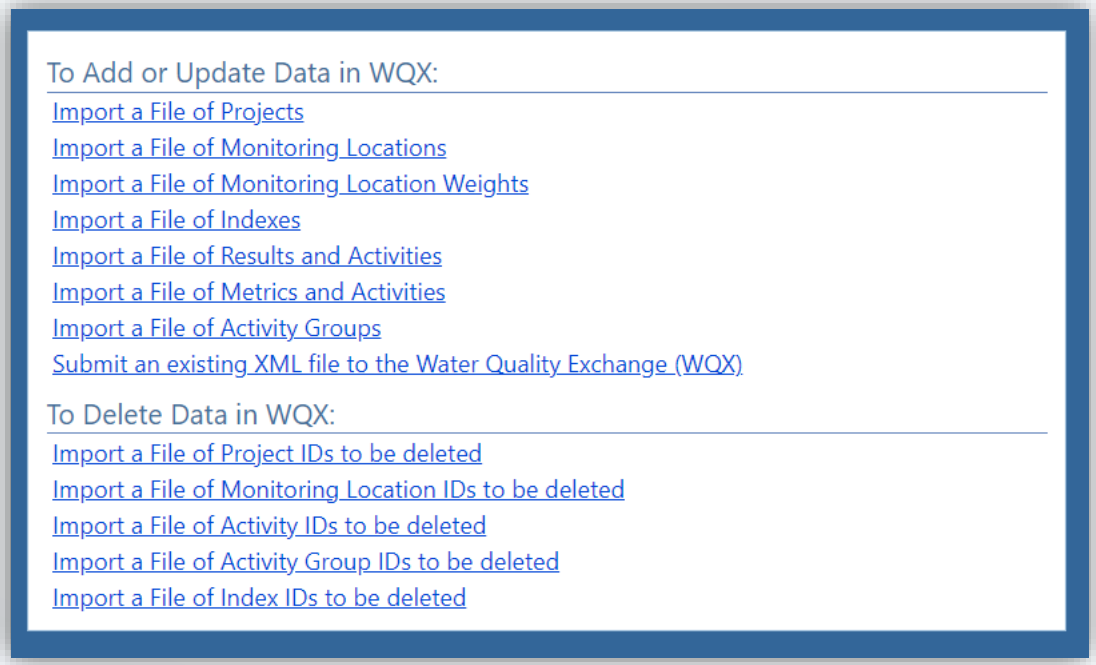
	L	M	N	O	P	Q	R	S	T	U
1	Sample Collection Method ID	Sample Collection Method Context	Sample Collection Equipment Name	Sample Collection Equipment Comment	Characteristic Name	Characteristic Name User Supplied	Method Speciation	Result Detection Condition	Result Value	Result Unit
2	Grab Sample Method		Water Bottle		Phosphate-phosphorus		as P	Not Detected		
3	Grab Sample Method		Water Bottle		Kjeldahl nitrogen		as N	Not Detected		
4	Grab Sample Method		Water Bottle		Total Nitrogen/Total Phosphorus Ratio (TN:TP)			Not Detected		
5	Grab Sample Method		Water Bottle		pH				7.1	None
6	Grab Sample Method		Water Bottle		Conductivity				4.3	mg/l
7	Grab Sample Method		Water Bottle		Turbidity			Not Detected		
8	Grab Sample Method		Water Bottle		Fecal Coliform			Not Detected		
9	Grab Sample Method		Water Bottle		Total Coliform			Not Detected		
10	Field Sample Method		Probe/Sensor		Temperature, water				11.2	deg C
11	Field Sample Method		Probe/Sensor		pH				8.02	None
12	Field Sample Method		Water Bottle		Escherichia coli				119	MPN/100ml
13	Field Sample Method		Water Bottle		Turbidity				0.98	NTU

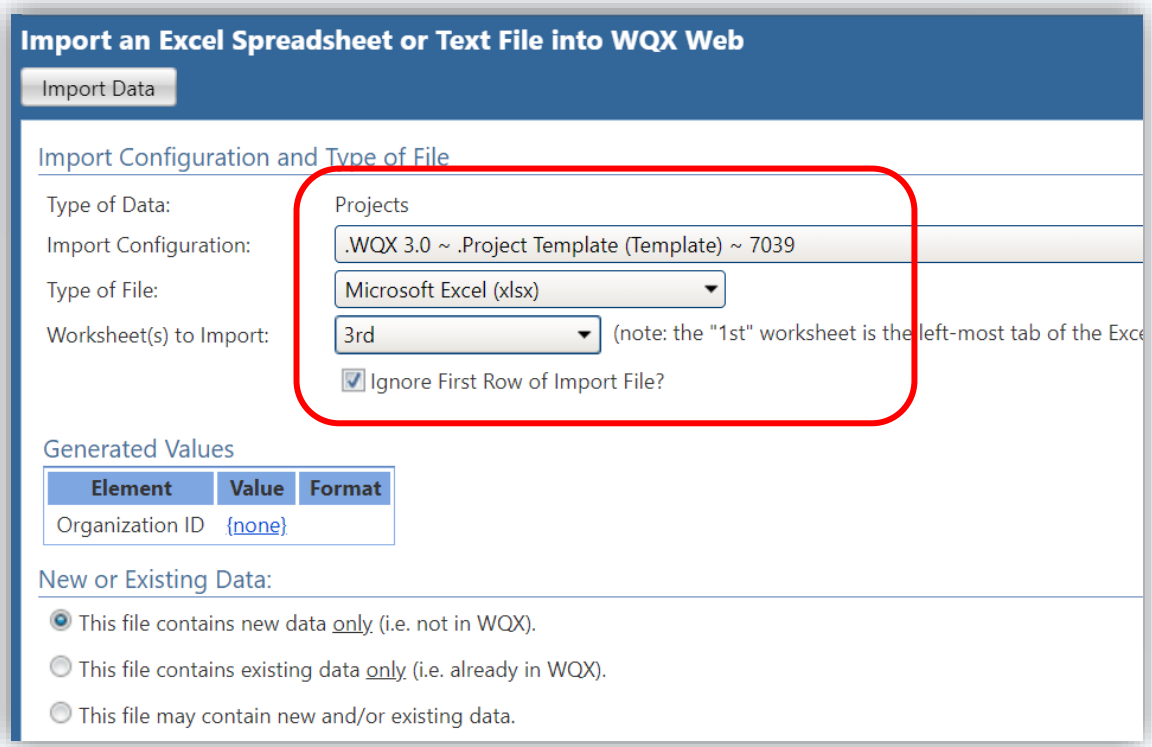
Step 6: Log in to WQXWeb

1. Register your Organization's unique sample collection or analysis methods
2. If you made any edits to the columns of the template, you'll need to adjust its matching import configuration (or start your custom upload)
3. Import your Web Template file with all your data



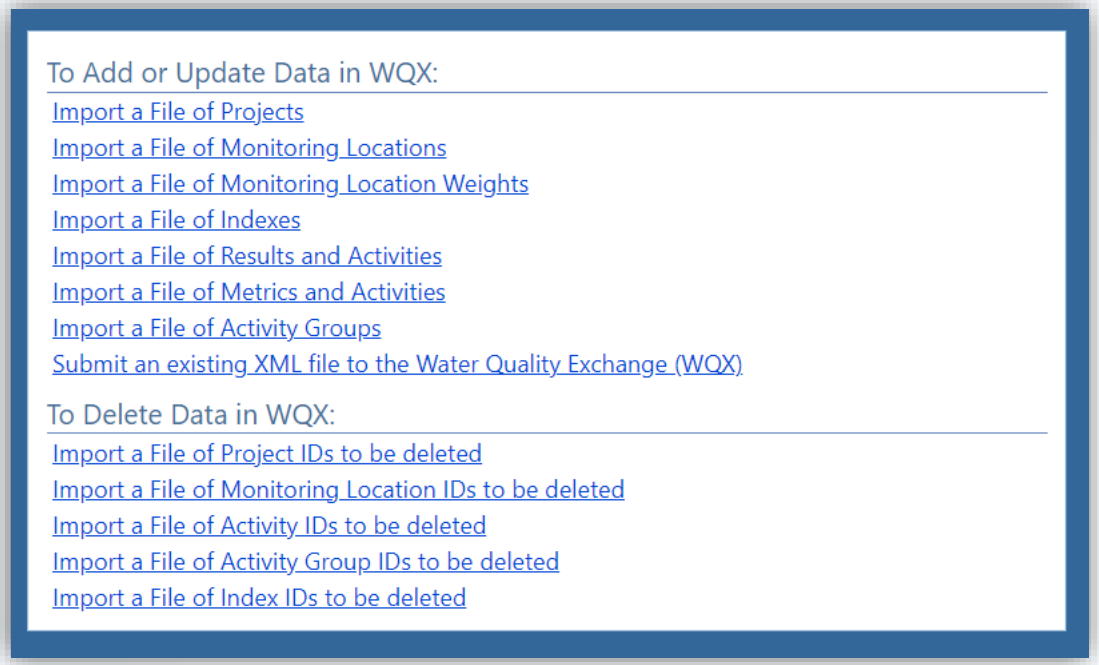
Step 7: Import your dataset

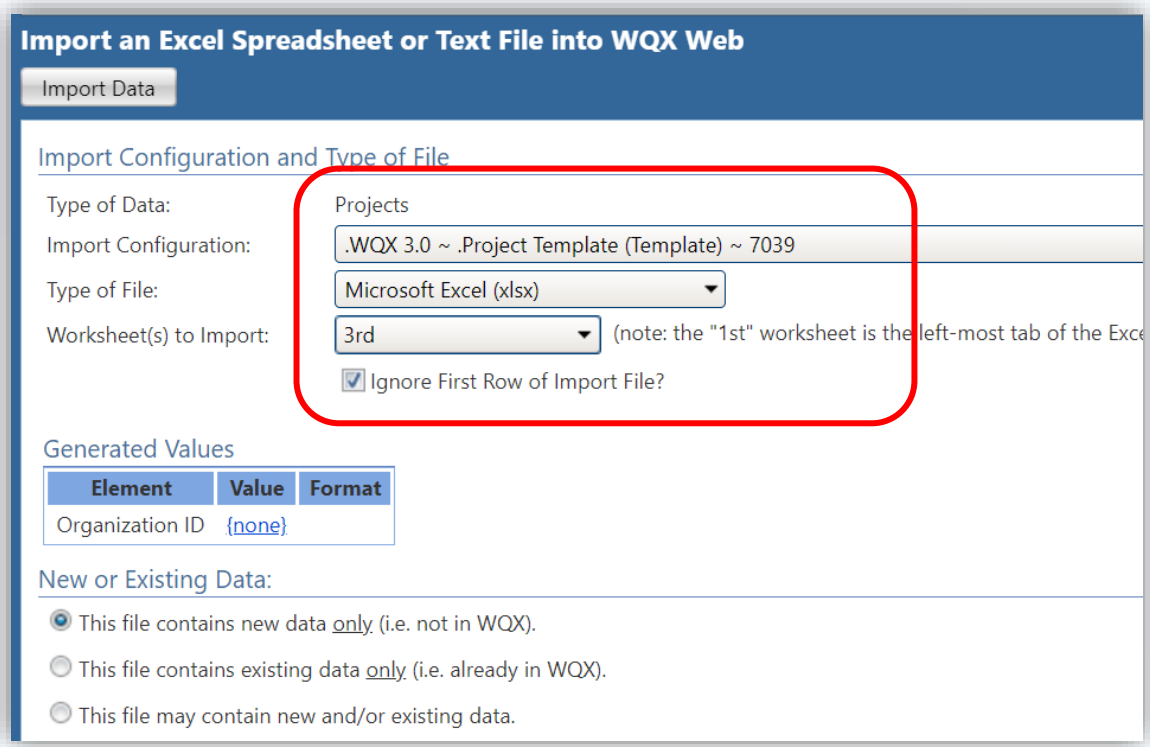




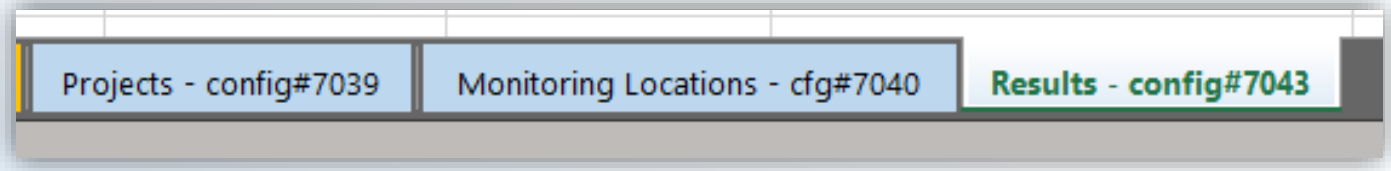
- First select the matching Project Import config from the template #7039
- It will automatically know that the data is on the 3rd tab of an Excel sheet
- Hit Import!

Step 8: Upload your data



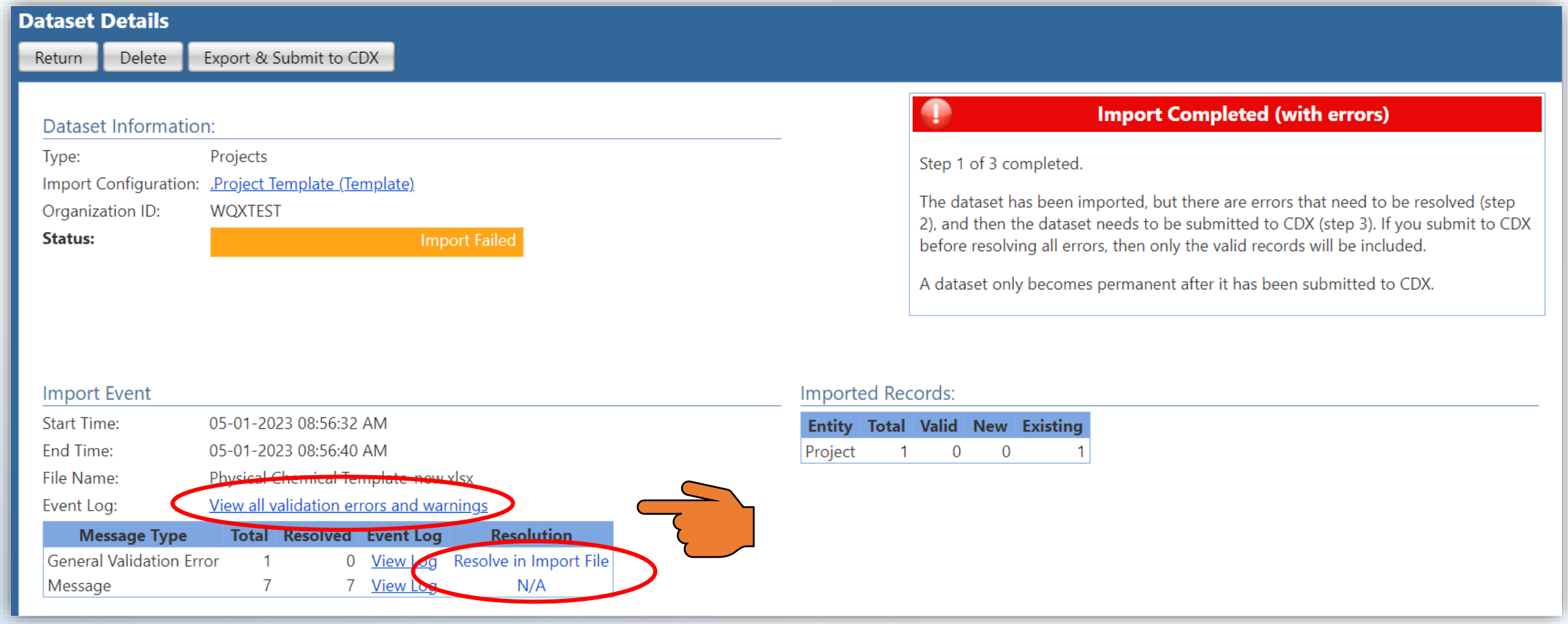


Repeat these steps for your Locations and Results data, using the matching import configuration for each tab of the file.



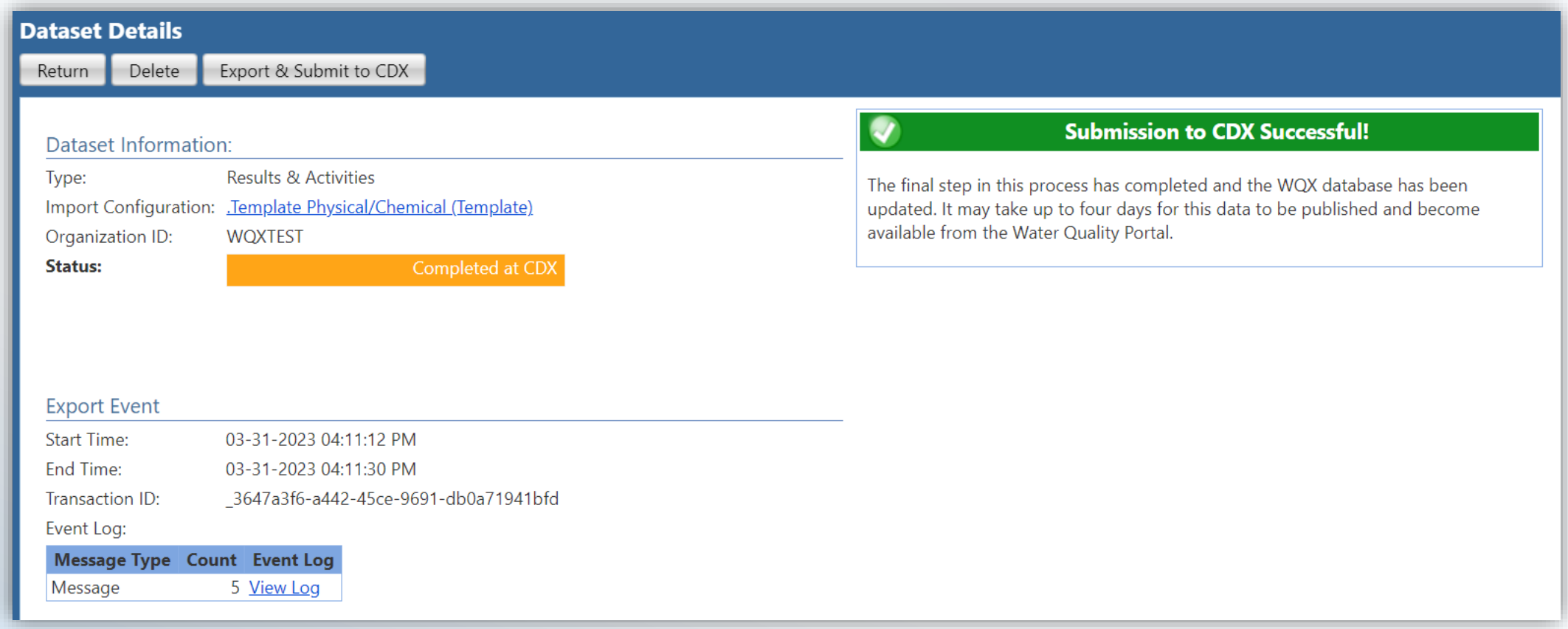
Step 9: Review your data/Troubleshooting

- After importing, you will immediately see if the upload passes validation and be able to review and resolve any errors



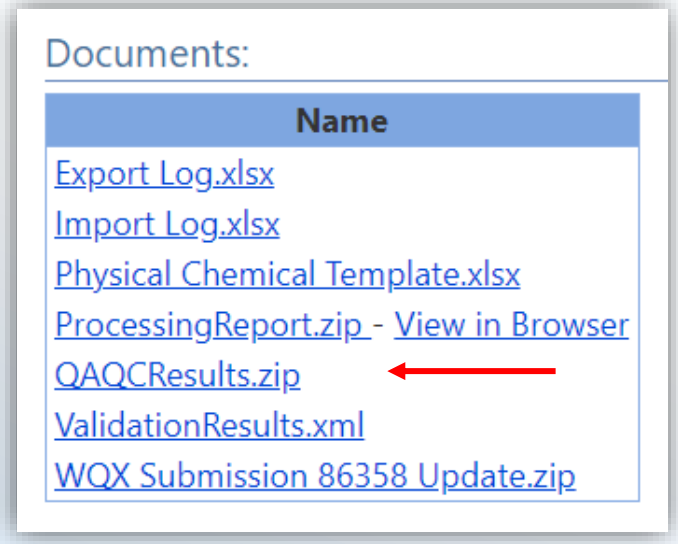
Step 10: Export your data to CDX

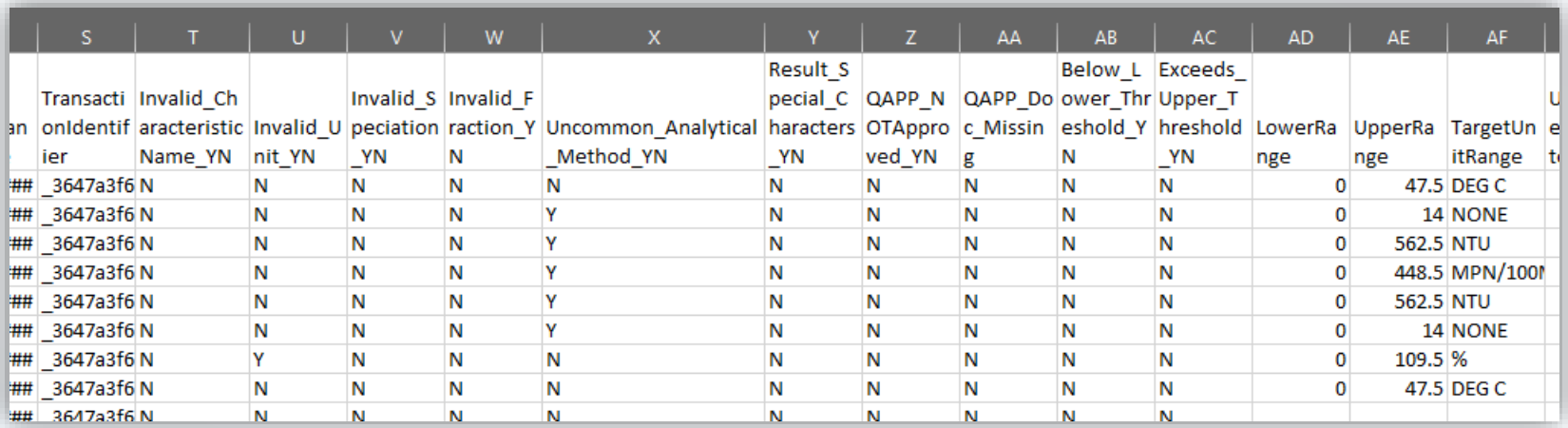
- If your imported dataset/configuration combo passes validation, you can Export and Submit the file to CDX



Step 11: Review your Submission

- After the Export to CDX has been completed, you will be able to hit a “Refresh Documents” button to retrieve QA reports of your submission and other documents.
- Review these QA reports to check your data against our QA flags





	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	
an	TransactionIdentifier	Invalid_CharacteristicName_YN	Invalid_Unit_YN	Invalid_Speciation_YN	Invalid_Fraction_YN	Uncommon_Analytical_Method_YN	Result_Special_Characters_YN	QAPP_NOTApproved_YN	QAPP_Doc_Missing	Below_Lower_Threshold_YN	Exceeds_Upper_Threshold_YN	LowerRange	UpperRange	TargetUnitRange	U e t
##	_3647a3f6	N	N	N	N	N	N	N	N	N	N	0	47.5	DEG C	
##	_3647a3f6	N	N	N	N	Y	N	N	N	N	N	0	14	NONE	
##	_3647a3f6	N	N	N	N	Y	N	N	N	N	N	0	562.5	NTU	
##	_3647a3f6	N	N	N	N	Y	N	N	N	N	N	0	448.5	MPN/100	
##	_3647a3f6	N	N	N	N	Y	N	N	N	N	N	0	562.5	NTU	
##	_3647a3f6	N	N	N	N	Y	N	N	N	N	N	0	14	NONE	
##	_3647a3f6	N	Y	N	N	N	N	N	N	N	N	0	109.5	%	
##	_3647a3f6	N	N	N	N	N	N	N	N	N	N	0	47.5	DEG C	
##	_3647a3f6	N	N	N	N	N	N	N	N	N	N				

Quick check-in – Any questions?

So what are the Data Requirements for WQX?

?

Available Fields

- The "Data Exchange Template"
- Web Templates – "All ResultElements"
- Within the Import Config Module

Allowable Values

- The WQX Domain List / Service
- The WQXWeb application
- Built into the Excel templates

Rules & Requirements

- Business Rules
- Required Fields
- Flow Configuration Document

How WQX Domains work

~75 WQX Fields have controlled Domain Values

GetDomainValues

To download the domain lists (as zipped CSV files), click the links below:

- All - The Entire Domain Lists (ZIP) | (XML)
- All-Individual Domains Library (ZIP) | (XML)

Individual Domain Values Lists:

- ActivityGroupType (ZIP) | (XML) | (CSV)
- ActivityMedia (ZIP) | (XML)| (CSV)
- ActivityMediaSubdivision (ZIP) | (XML)| (CSV)
- ActivityRelativeDepth (ZIP) | (XML)| (CSV)
- ActivityType (ZIP) | (XML)| (CSV)
- AddressType (ZIP) | (XML)| (CSV)
- AliasType (ZIP) | (XML)| | (CSV)
- AnalyticalMethod (ZIP) | (XML)
- AnalyticalMethodContext (ZIP) | (XML)| (CSV)
- Assemblage (ZIP) | (XML)| (CSV)
- BiologicalIntent (ZIP) | (XML)| (CSV)
- CellForm (ZIP) | (XML)| (CSV)
- CellShape (ZIP) | (XML)| (CSV)
- Characteristic (ZIP) | (XML)| (CSV)
- CharacteristicAlias (ZIP) | (XML)
- CharacteristicGroup (ZIP) | (XML)| (CSV)
- CharacteristicWithPickList* (ZIP) | (XML)
- Country (ZIP) | (XML)| (CSV)
- County (ZIP) | (XML)| (CSV)
- DetectionQuantitationLimitType (ZIP) | (XML)| (CSV)
- ElectronicAddressType (ZIP) | (XML)| (CSV)
- FrequencyClassDescriptor (ZIP) | (XML)| (CSV)
- Gear Procedure Unit (ZIP) | (XML)| (CSV)

Example Domain Value List

Domain	Unique Id	Name	Descriptic	Last Change Date
Biological Intent(	5	Frequency Class	for provid	7/18/2008 11:57
Biological Intent(	4	Group Summary	For	7/18/2008 11:57
Biological Intent(	1	Individual	For report	7/18/2008 11:57
Biological Intent(	3	Population Census	for provid	7/18/2008 11:57
Biological Intent(	7	Species Density	for provid	7/10/2013 0:00
Biological Intent(	9	Targeted Sampling	For report	6/12/2015 13:03
Biological Intent(	2	Tissue	For report	7/18/2008 11:57
Biological Intent(	6	Toxicity	For report	7/18/2008 11:57

Your Dataset

AX	AY	AZ	
Biological Intent	Biological Individual ID	Subject Taxonomic Name	Ta
Population Census		Dicranota	
Population Census		Baetis	18
Population Census		Hydropsychidae	
Frequency Class		Cheumatopsyche	
Frequency Class		Chironomini	
Frequency Class		Dicranota	
Frequency Class		Dicranota	

Value Lists we follow:

- EPA Substance Registry System
- ITIS (Taxonomic names, TSNs)

Domain Lists the User Controls:

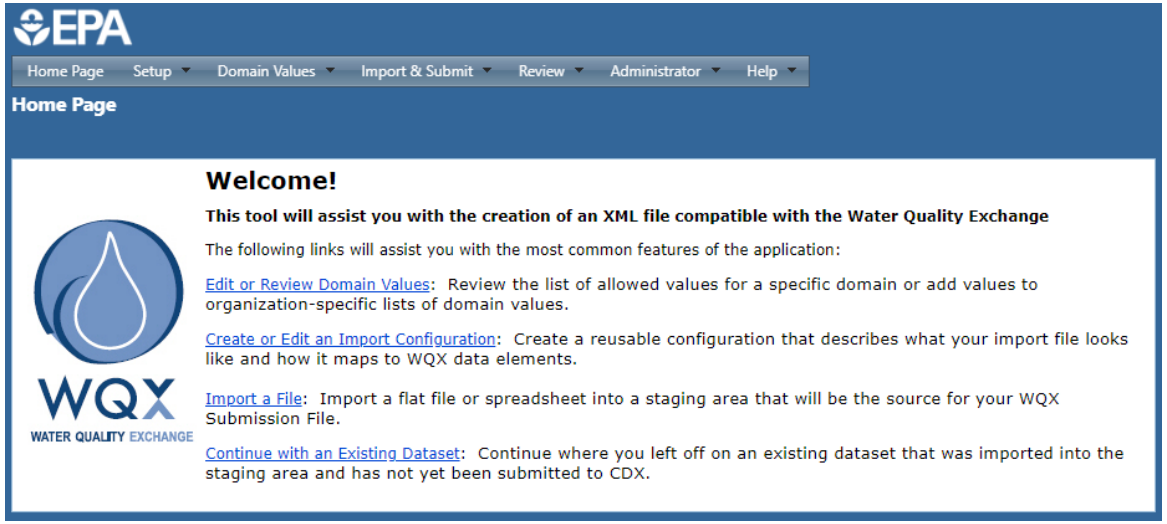
- Your Projects
- Your Locations
- Sample Collection Methods
- Analytical Methods
- Your Metrics

All Other Domain Lists:

- Maintained by EPA at direction of the WQX User Community

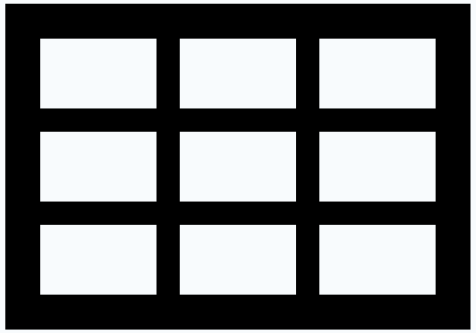
What can WQX Web do?

- Review all the allowable values and register your unique sampling or analytical methods
- Import your datasets
- Build custom import configurations for your dataset
- Review a number of reports on the data
- Receive QA/QC reports
- Custom error resolution



Templates and Import Configurations

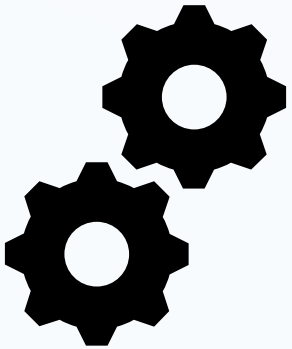
Templates



Standardized Data Format

Using WQX – Templates	Water Quality Exchange Web Template User Guide | US EPA Link to Web Templates Web Templates Overview Video

Import Configurations



Reads and Configures Dataset to the WQX-XML

Using WQX – Import Configurations	WQX Web Import Configuration Options Translations via Expert Mode

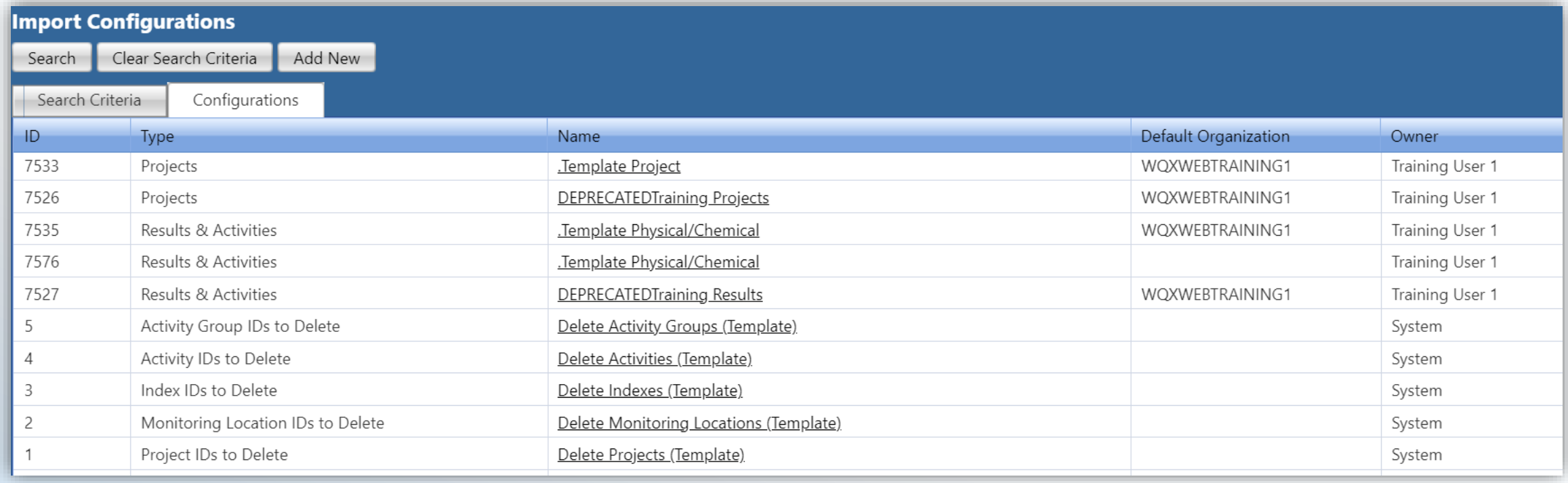
The Power of Import Configurations

Three main flavors

- Import, edit, delete

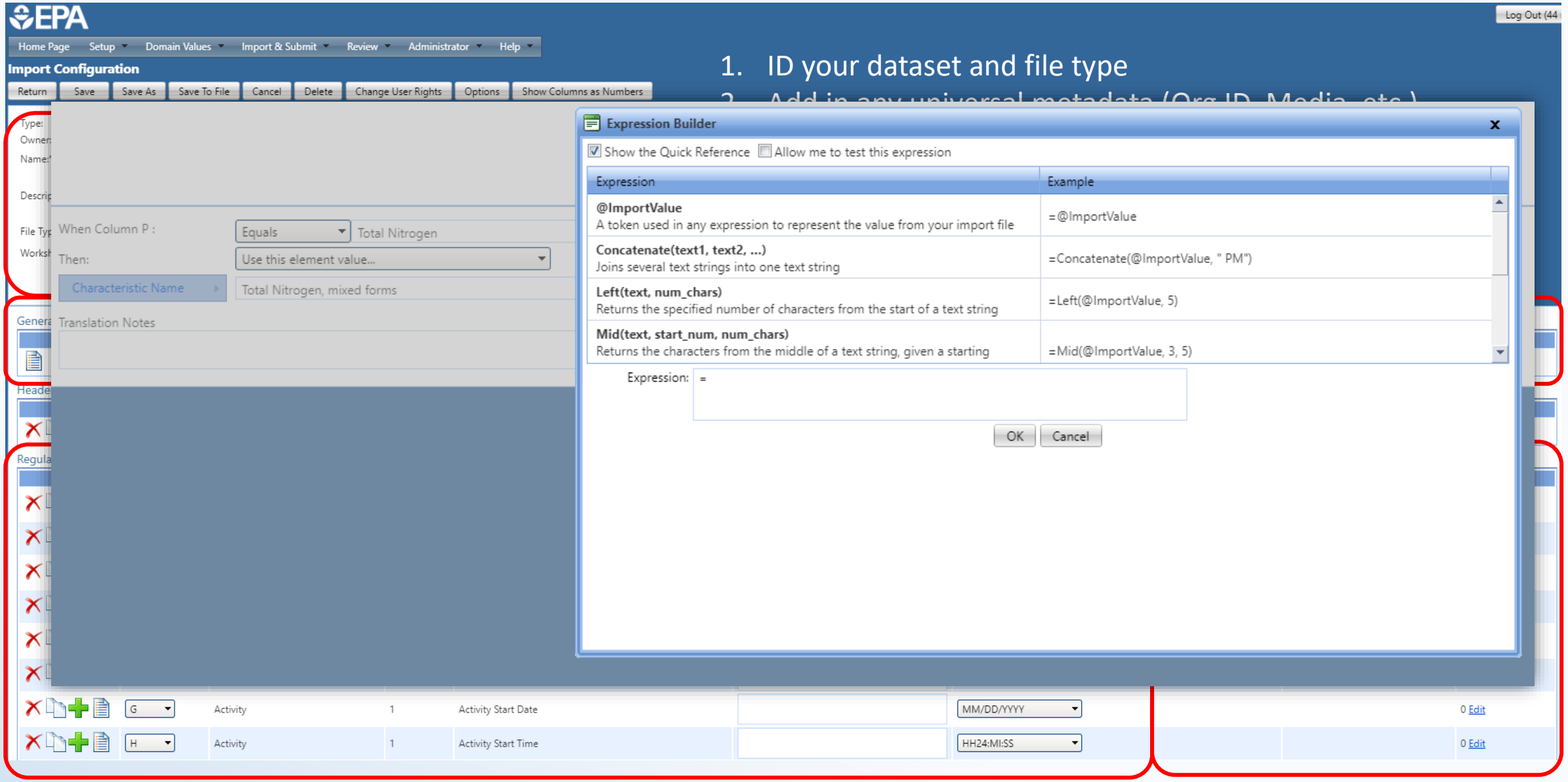
Unique to level of information

- Projects, Locations, Results and Activities, Indexes, Monitoring Location Weights



ID	Type	Name	Default Organization	Owner
7533	Projects	.Template Project	WQXWEBTRAINING1	Training User 1
7526	Projects	DEPRECATEDTraining Projects	WQXWEBTRAINING1	Training User 1
7535	Results & Activities	.Template Physical/Chemical	WQXWEBTRAINING1	Training User 1
7576	Results & Activities	.Template Physical/Chemical		Training User 1
7527	Results & Activities	DEPRECATEDTraining Results	WQXWEBTRAINING1	Training User 1
5	Activity Group IDs to Delete	Delete Activity Groups (Template)		System
4	Activity IDs to Delete	Delete Activities (Template)		System
3	Index IDs to Delete	Delete Indexes (Template)		System
2	Monitoring Location IDs to Delete	Delete Monitoring Locations (Template)		System
1	Project IDs to Delete	Delete Projects (Template)		System

The Power of Import Configurations



1. ID your dataset and file type
2. Add in any universal metadata (Org ID, Media, etc.)

Example Dataset

- Stacked data, structured metadata, non-WQX values
- Is this dataset WQX-ready?

Yes! A custom import config will be required to transform all the metadata values (When x = 'XXXXX' then…)

StationCode	SampleDate	AgencyCode	SampleComments	LocationCode	GeometryShape	CollectionTime	CollectionMethodCode	SampleTypeCode	Replicate	CollectionDeviceName	CollectionDepth	UnitCollectionDepth	PositionWaterColumn	LabCollectionComments	LabBatch
Sediment Chemistry															
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Sed_Grab	Integrated	1	scoop, polyethylene	2	cm	Not Applicable		WPCL_L-024-226-09_BS559_S_PAH
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Sed_Grab	Integrated	1	scoop, polyethylene	2	cm	Not Applicable		WPCL_L-024-226-09_BS559_S_PAH
Water Chemistry															
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	Individual Collection by hand	0.1	m	Subsurface	Field dup taken	WPCL_L-222-226-09_W_OCH
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	2	Individual Collection by hand	0.1	m	Subsurface		WPCL_L-222-226-09_W_OCH
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	Individual Collection by hand	0.1	m	Subsurface		MPSL-DFG_WTM071509_W_TM
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	Individual Collection by hand	0.1	m	Subsurface		WPCL_L-222-226-09_W_TRIAZ
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	Individual Collection by hand	0.1	m	Subsurface		WPCL_4832_W_NH3
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	MS1	1	Not Recorded	0.1	m	Not Applicable		MPSL-DFG_WTM071509_W_TM
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	MS2	1	Individual Collection by hand	0.1	m	Subsurface		SFL_170690_W_B
LABQA	28/Apr/2009	DFG-WPCL		Not Applicable		00:00	Not Applicable	CRM	1	None	-88	m	Not Applicable		WPCL_4798_W_CL
LABQA	28/Apr/2009	DFG-WPCL		Not Applicable		00:00	Not Applicable	CRM	1	None	-88	m	Not Applicable		WPCL_4753_W_SO4
LABQA	28/Apr/2009	DFG-WPCL		Not Applicable		00:00	Not Applicable	LabBlank	1	None	-88	m	Not Applicable		WPCL_4798_W_CL
Bacteria															
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	RWQCB5S Sampling pole w/ac	0.1	m	Subsurface		RWB5S_STS_ARW110711_W_Bac
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	RWQCB5S Sampling pole w/ac	0.1	m	Subsurface		RWB5S_STS_ARW110711_W_Bac
FIELDQA	28/Apr/2009	MPSL-DFG		Not Applicable		00:00	Not Applicable	TravelBlank	1	None	-88	m	Not Applicable		RWB5S_STS_ARW110711_W_Bac
LABQA	28/Apr/2009	RWQCB5S		Not Applicable		00:00	Not Applicable	LabBlank	1	None	-88	m	Not Applicable		RWB5S_STS_ARW110711_W_Bac
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	RWQCB5S Sampling pole w/ac	0.1	m	Subsurface		RWB5S_STS_ARW110711_W_Bac
723NROTWM	28/Apr/2009	MPSL-DFG		Bank	Point	16:55	Water_Grab	Grab	1	RWQCB5S Sampling pole w/ac	0.1	m	Subsurface		RWB5S_STS_ARW110711_W_Bac

Example Dataset

- Wide format file: stack or Crosstab Import Config
- Is this file WQX-ready?

Yes! A custom import config will be required to transform the data and apply metadata

A	B	C	D	E	F	G	H	I
RecNo	AwwSiteID	Sample Date	Sample Time	Air Temp °C	Water Temp °C	Sample Volume (ml)	E. coli / 100 mL (cfu)	Tot coli / 100 mL (cfu)
1	7	6-Jun-08	8:30	27.0	28.0	1.0	67	500
2	8	26-Jun-99	11:45		23.0	1.0	50000	75000
3	8	26-Jun-99	11:45		23.0	1.0	50000	75000
4	9	30-Sep-99	18:08		20.0	1.0	33	1167
5	9	20-Sep-00	14:00		21.0	1.0	0	2467
6	10	30-Sep-99	17:55		19.0	1.0	67	1267
7	10	20-Sep-00	14:15		27.0	1.0	0	2067
8	11	30-Sep-99	17:45		19.0	1.0	233	1900
9	11	20-Sep-00	14:30		28.5	1.0	0	13333
10	11	13-May-08	12:00		22.0	1.0	167	3733
11	15	25-Sep-99	10:15		21.0	1.0	0	4933
12	16	27-Aug-99	17:35		28.0	1.0	33	5667
13	17	27-Aug-99	17:05		28.0	1.0	167	25167
14	19	13-Jul-00	15:15		27.0	1.0	0	25000
15	19	20-Sep-00	13:24		22.0	1.0	33	1400
16	22	27-Oct-01	8:45			0.5	16667	19533
17	22	4-Nov-01	10:35		15.0	0.5	67	1800
18	22	2-Feb-02	11:35		12.0	1.0	100	2800
19	25	2-Aug-00	12:30		27.0	1.0	3967	6333
20	25	5-Sep-00	13:15		29.0	1.0	100	2600
21	25	3-Oct-00	13:30		26.0	1.0	0	1600
22	27	18-Oct-99	14:50		23.5	1.0	100	4167
23	27	15-Apr-00	13:00		18.0	1.0	867	25867
24	27	27-Aug-00	11:45		26.0	1.0	1267	2567

WQX Basic Resources

Topic Area	Resource Links
Open Water Data Resources / Links	Water Quality Exchange (WQX) [Data In] The Water Quality Portal (WQP) [Data Out] How's My Waterway (HMW) [Info Out] Central Data Exchange (CDX) [Data Held] Exchange Network (Node Submissions to CDX)
WQX Nuts and Bolts	Upload Resources Page Glossary of Terms Business Rules Data Exchange Template (List of Available Elements) Domain Service (Acceptable Values)
Using WQX – Getting Started	Introduction to WQX, WQX Web, and WQP (5 min video) Quick WQX Web User Guide (PDF Guide) User Guide Version 3.0 for Water Quality Exchange Web Getting Started with WQX Web: How to Gain Access WQX Web Basics – Two-part session--Day 1 WQX Web Basics – Two-part session--Day 2
Using WQX – Templates	Water Quality Exchange Web Template User Guide | US EPA Link to Web Templates Web Templates Overview Video
Using WQX – Import Configurations	WQX Web Import Configuration Options Translations via Expert Mode
Using WQX – Best Practices	Best Practices for Sharing Benthics Data WQX Metals Best Practices Guide WQX Nutrients Best Practices Guide
Using WQX - Other	Water Quality eXchange Factsheet Common Errors Resolution WQX Program Information

Helpdesk / Support / Training

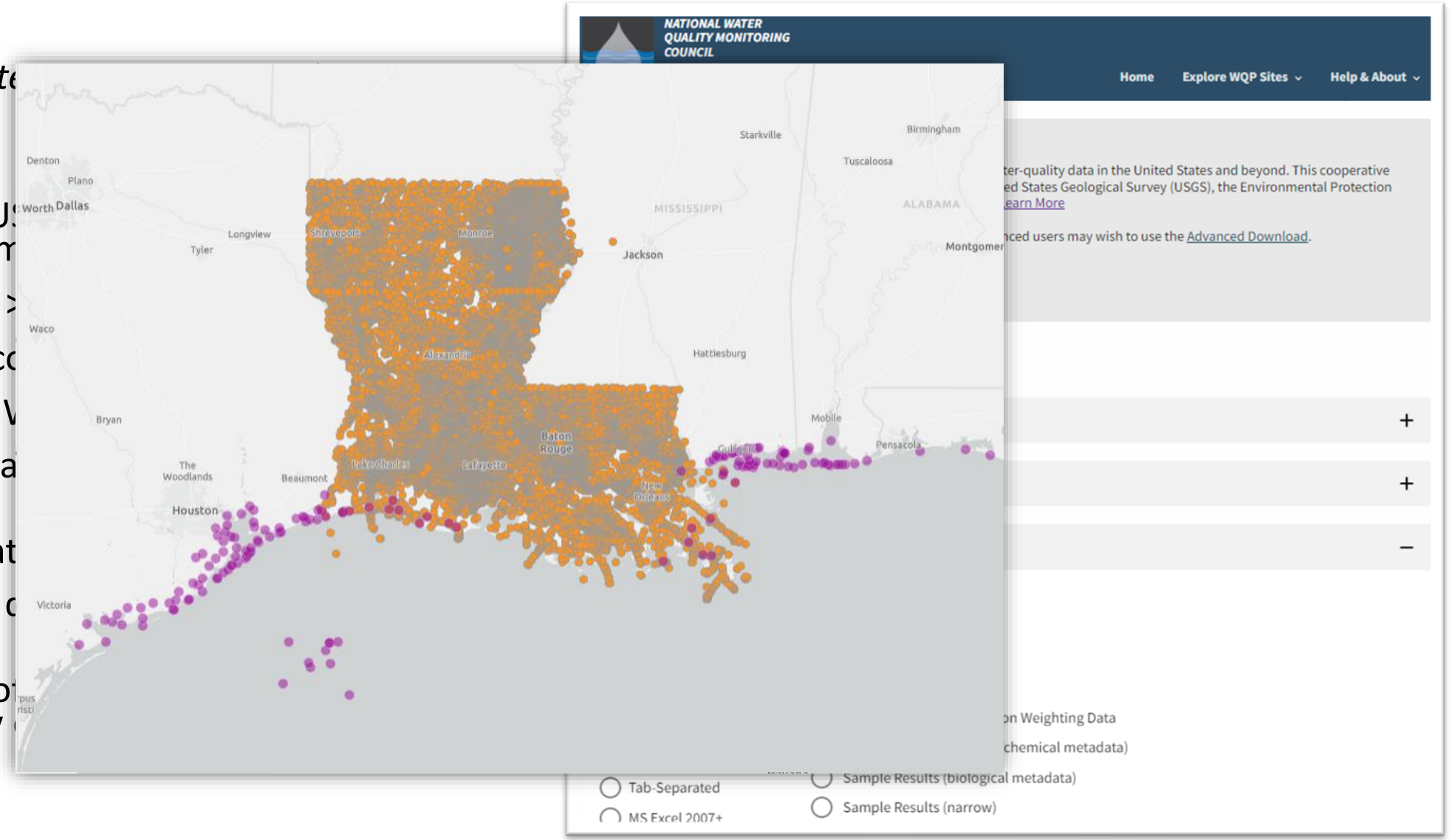
- We can be reached at WQX@epa.gov M-F 8am-5pm
- We also have a 1-800 number where you can leave a voicemail
- Monthly User Call
- Several user guides
- Best-practice manuals
- Instructional videos on Youtube
- Access one-on-one support from WQX contractors

Using Your Data from the Water Quality Portal

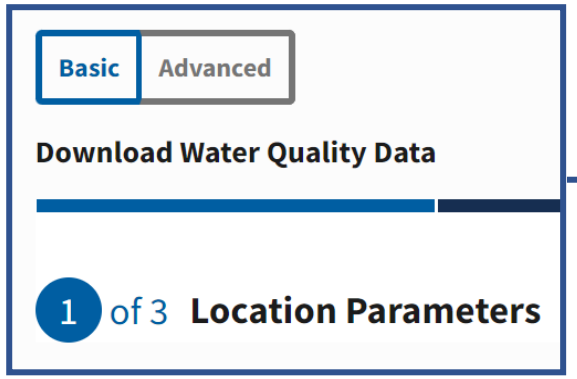
Water Quality Portal

Operated under An Inte
(USGS & EPA)

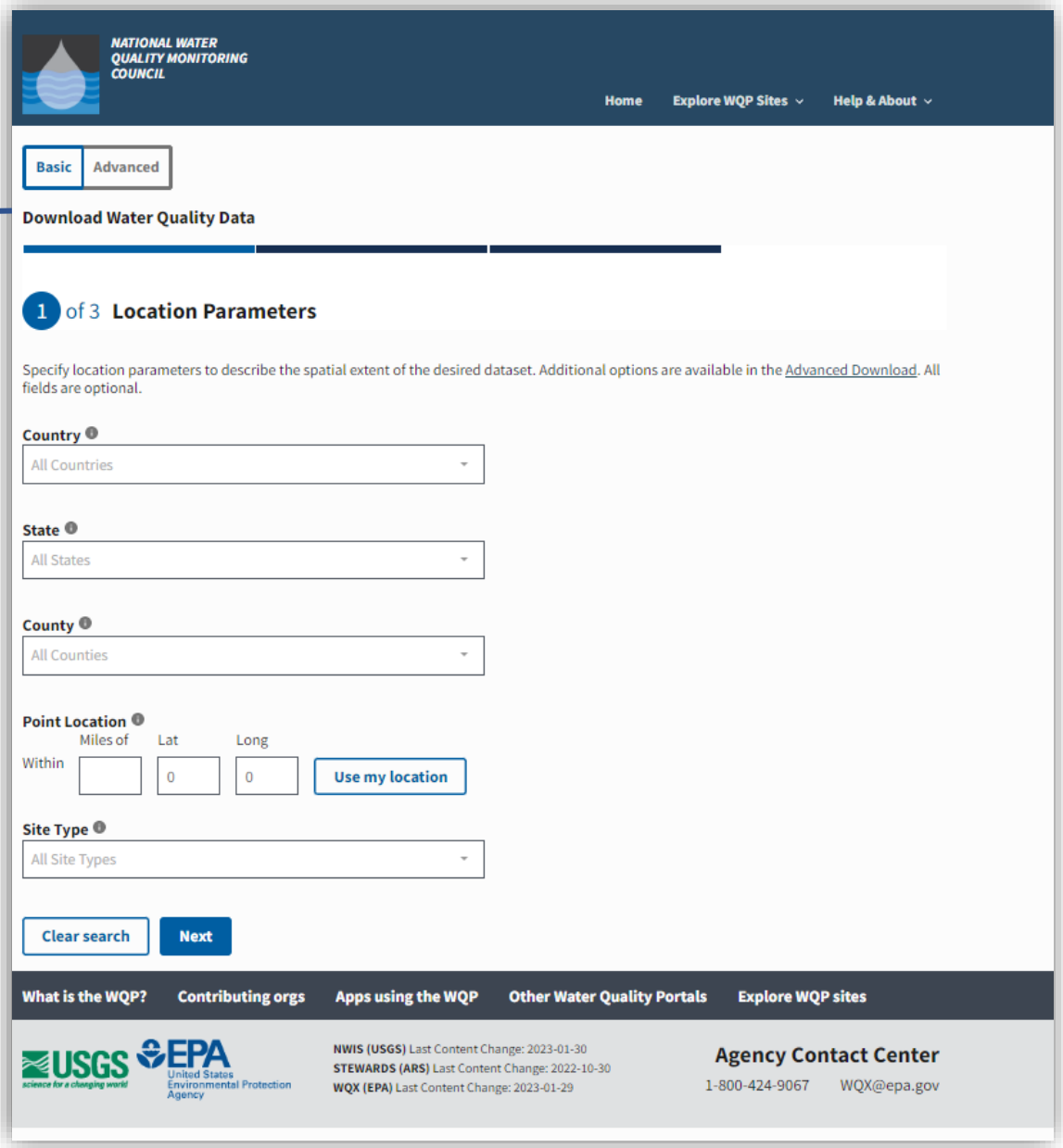
- Serves data from U
  standard WQX form
- # WQP: Data from >
- # WQP: >410m recc
- Serves data OF All V
- Includes a Graphica
  Services
- One of Our Integrat
- DATA ServiceS can c
  in HMW
- Growing Number o
  top of this Primary



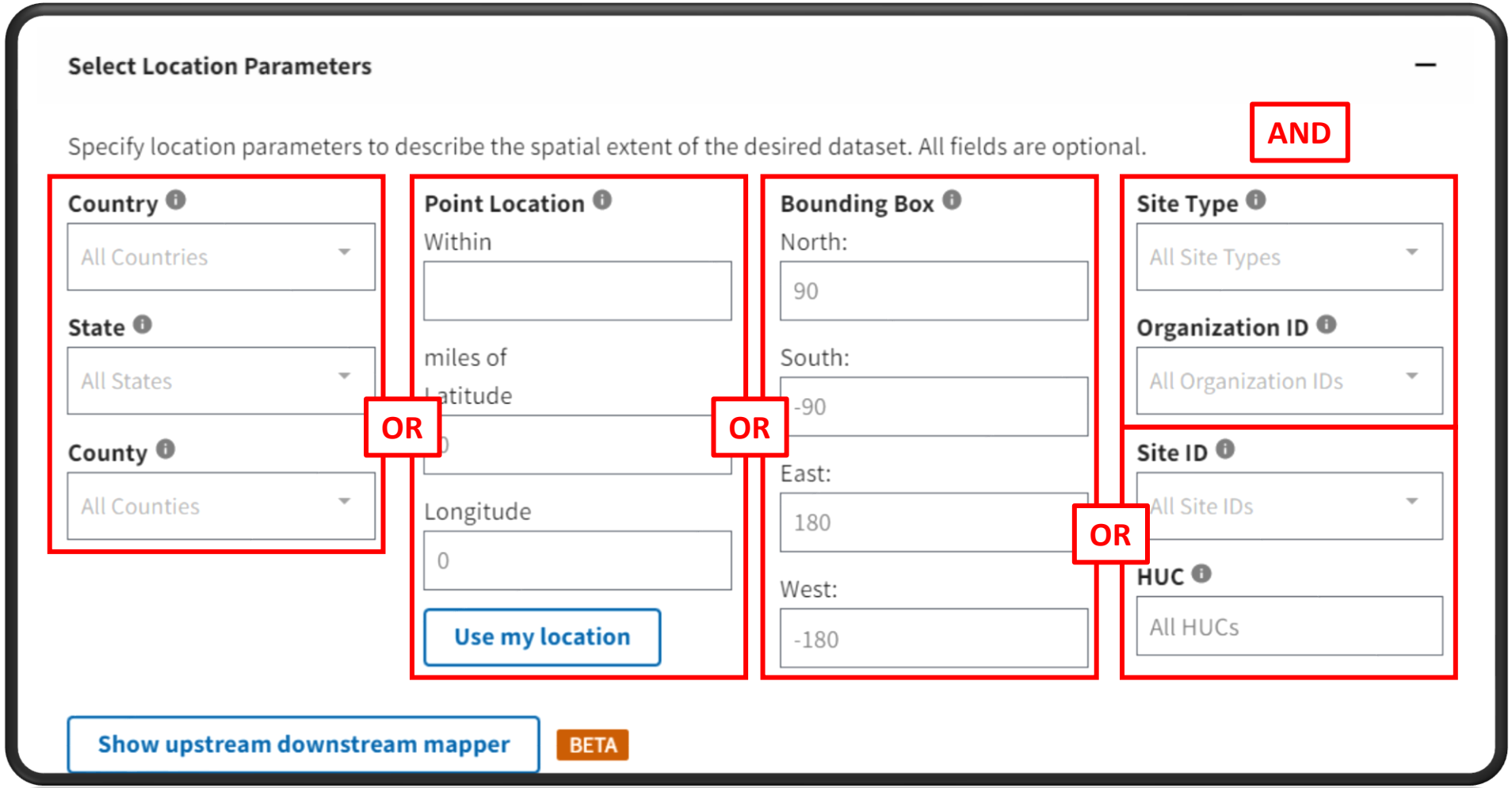
Water Quality Portal



Start your search here, if searching by a state, county, or point location. Or, click on the Advanced Tab to open up additional search options



Building Your Query - Locations



Filtering Your Results

Water, sediment, tissue, etc.

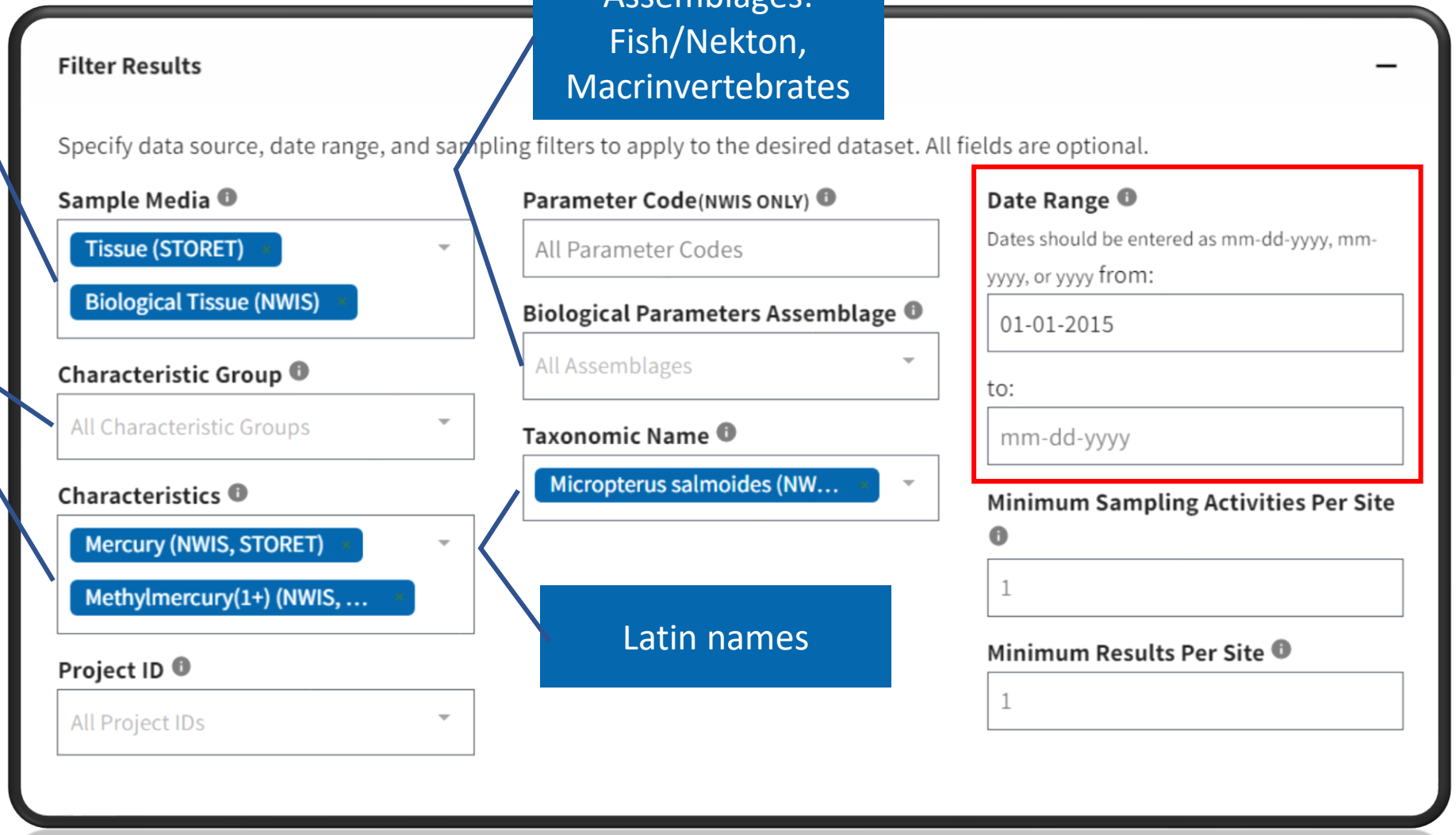
Chemicals, physical measures, obs., etc.

Example of a query to retrieve fish contaminant data (Mercury in largemouth bass)

*optional

Assemblages: Fish/Nekton, Macrinvertebrates

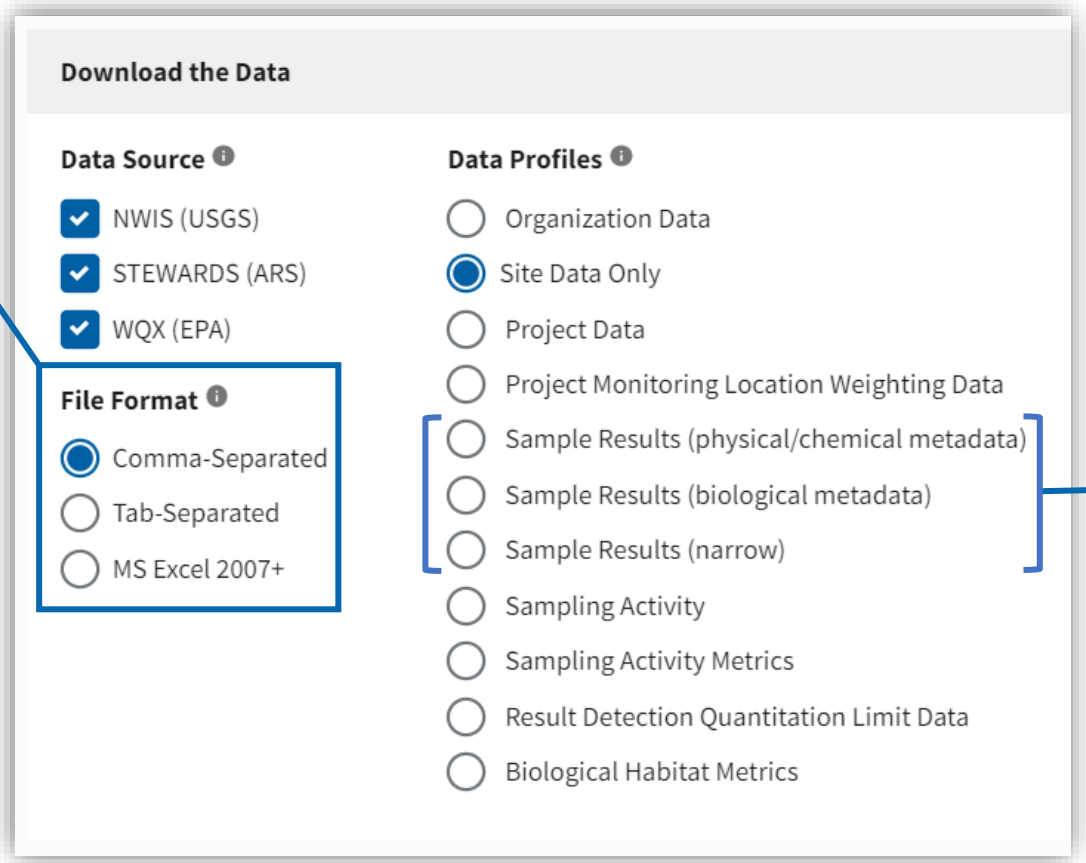
Latin names



Download your Data

WQX/WQP support a LOT of metadata.

Choose your download format



Results measures and result-level metadata

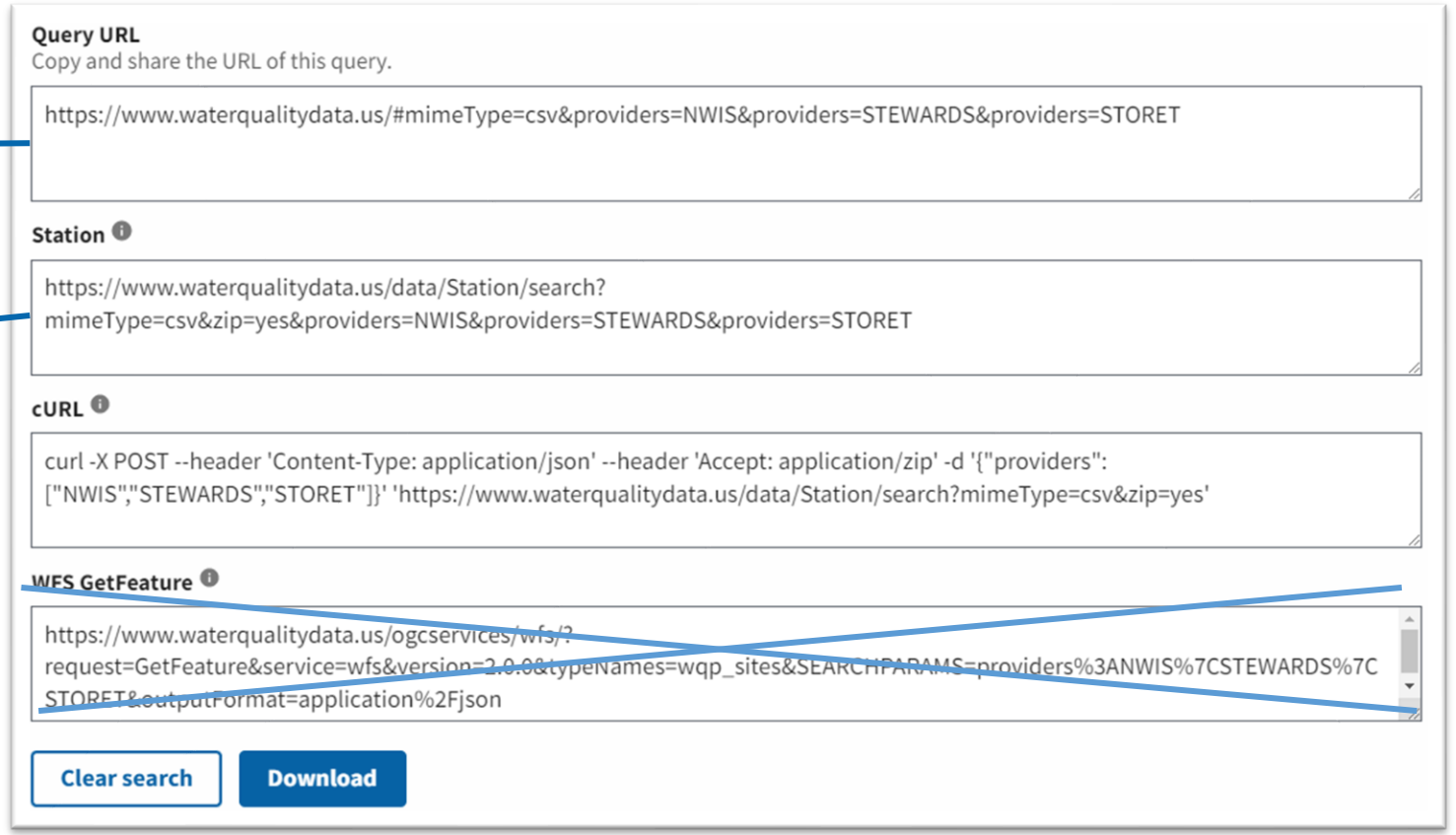
Using Data from WQP Web Services

- Web services are URLs that provide the instructions from your query

Save the URL to your Query

URL of your data download

Use this web service URL in data applications



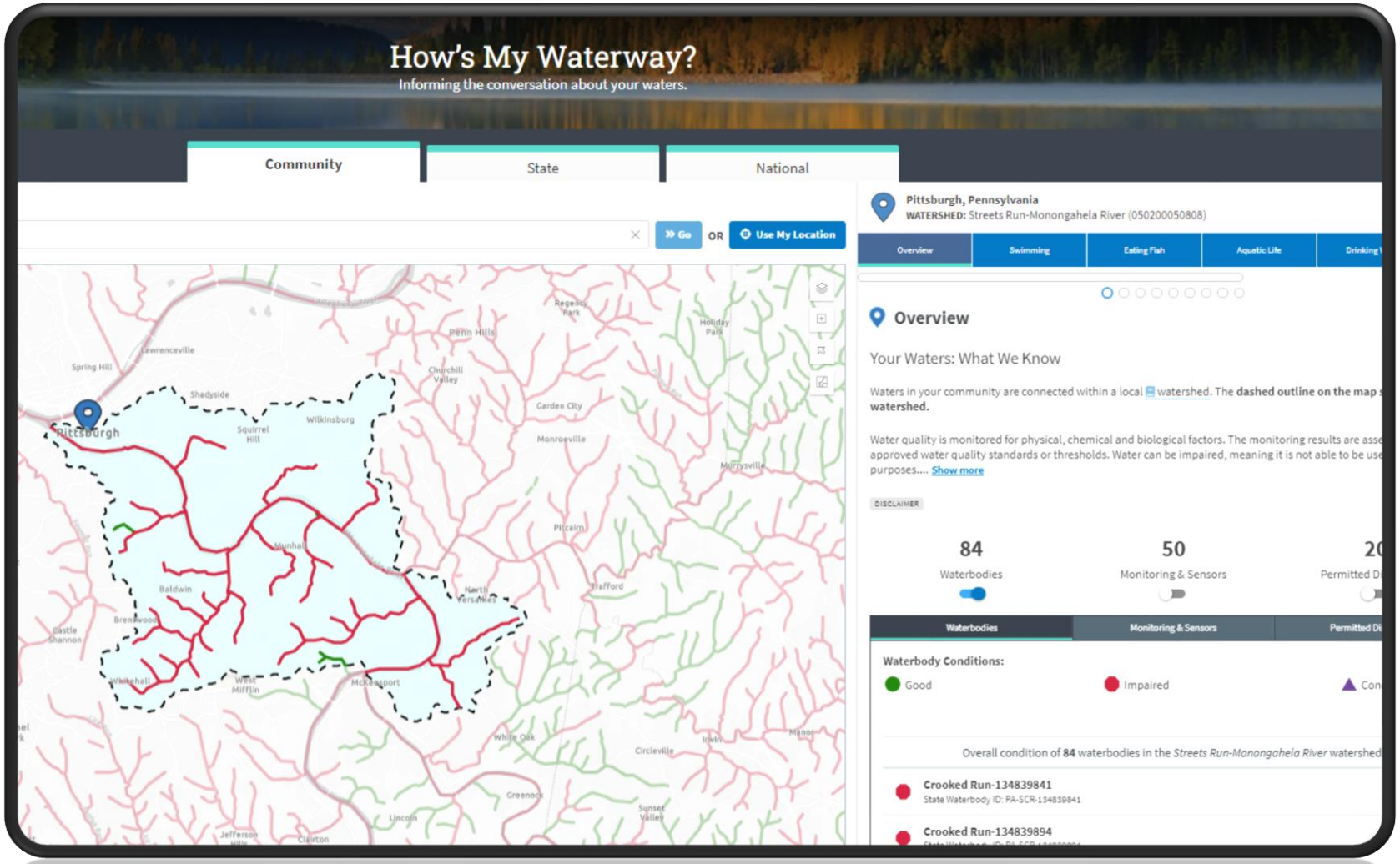
How's My Waterway

Public Information

Powered by open data and web services

Accesses, interprets, and displays data from over a dozen sources

Including ATTAINS, and the WQP among many others



WQX 1-on-1s tomorrow

- Please contact me at Griggs.adam@epa.gov to schedule a time

Questions or Demo

As time allows